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## ORIGINAL COMMUNICATIONS.

(Original Communications are received with the understanding  
that they are contributed exclusively to THE LARYNGOSCOPE.)

### FURTHER CONCERNING THE ACOUSTIC NEUROMAS.\*

DR. HARVEY CUSHING, Boston, Mass.

In a monograph on the subject of the eighth-nerve tumors, published three years ago, emphasis was laid on the desirability in the future of concentrating our attention upon particular tumors in particular situations rather than upon intracranial tumors in general, if we are to make progress in the early recognition, the correct diagnosis and the preferential treatment of any one type of these common lesions.

In the past, physicians have felt that they have done well enough even to make a diagnosis of tumor at all, based on the presence of general pressure symptoms. Today there can hardly be any excuse not to go farther than this and to distinguish in most cases between a tumor above and a tumor below the tentorium. But we should not be satisfied with this, for it should often be possible to determine just where the tumor arises and to foretell before operation, not only its exact situation but what its histological character will prove to be. With such precise fore-knowledge the way is open for the development of a definite therapeutic program in place of the hit-or-miss surgical methods usually employed. An operative procedure having been adopted one must proceed to a comparison of its immediate as well as end results with those of the various other proposed methods of surgical access. Only in

\*Remarks before the New England Otological and Laryngological Society Meeting at the Peter Bent Brigham Hospital, November 18, 1920.

this way can we reach a common conclusion as to which procedure is most likely to lower the primary operative mortality and insure the longest and most complete release from symptoms.

With the acoustic neuromas we are today further advanced in these matters than in the case of any other intracranial tumors, though one may possibly except certain pituitary lesions in which the diagnosis may be almost equally exact.\*

It is my purpose at this time to give some brief notes of the cases seen since the series presented in my monograph, for despite a two years' absence the number has been considerably augmented and I wish to bring the tabulation of cases up to date so that the score may stand as one against which those in my own clinic as well as in others may in the future compete, for it is unquestionably capable of betterment.

As before, a general assembly to November 1, 1920, of all the tumors in the series (Table 1), of the posterior tumors (Table 2), and of the tumors of the angle in particular (Table 3) shows that the acoustic neuromas represent 7.3 per cent of *all verified\* tumors* (47 in 639 cases); 24.5 per cent of *all verified posterior lesions* (47 in 192 cases); 60.3 per cent of *all proven extracerebellar cases* (47 in 78 cases); and far and away the larger percentage of all tumors with symptoms pointing unmistakably to the *cerebellopontile angle* (47 in 60 cases). When tumor symptoms, therefore, point to the recess and begin with deafness one may feel fairly certain of a diagnosis.

In spite of what has been said of the comparative ease of diagnosis, errors will be made, but it is from our mistakes, if we pursue them into the open instead of obscuring them, that we learn the most—your mistakes as laryngologists and otologists and our mistakes as neurologists, for we are by no means exempt. But our mistakes, as will be seen, are more often from incorrect localizations, whereas yours are more often due to the failure to recognize the presence of a tumor at all. This, I think, should be just reversed, at least on the part of the otologists who should, before any others, be able to recognize these acoustic tumors.

I shall begin with one of your mistakes, for it was this unhappy experience that possibly precipitated this meeting. The essentials of the story are as follows:

\*Some other tumors, like the parasagittal or Gasserian endotheniomas, are pressing for first place in certainty of diagnosis and precision of surgical treatment.

\*The term "verified" indicates the lesion has received histological identification except in the case of gliomatous cysts, whose straw-colored fluid is a sufficiently accurate means of identification without the microscope.



TABLE 1.—INCLUDING ALL TUMORS.

| Series         | Fore Brain |            |          | Hind Brain |            |          | Total |
|----------------|------------|------------|----------|------------|------------|----------|-------|
|                | Verified   | Unverified | Suspects | Verified   | Unverified | Suspects |       |
|                |            |            |          |            |            |          |       |
| Baltimore..... | 142        | 71         | 23       | 53         | 34         | 14       | 337   |
| Boston.....    | 305        | 167        | 76       | 139        | 80         | 34       | 801   |
| Total.....     | 447        | 238        | 99       | 192        | 114        | 48       | 1138  |

TABLE 2.—POSTERIOR LESIONS (MID AND HIND BRAIN).

| Series         | Intracerebellar |            |          | Extracerebellar |            |          | Pontile  |            | Total |
|----------------|-----------------|------------|----------|-----------------|------------|----------|----------|------------|-------|
|                | Verified        | Unverified | Suspects | Verified        | Unverified | Suspects | Verified | Unverified |       |
|                |                 |            |          |                 |            |          |          |            |       |
| Baltimore..... | 24              | 20         | 8        | 22              | 10         | 5        | 7        | 5          | 101   |
| Boston.....    | 78              | 43         | 34       | 56              | 24         | 0        | 5        | 13         | 253   |
| Total.....     | 102             | 63         | 42       | 78              | 34         | 5        | 12       | 18         | 354   |

TABLE 3.—EXTRACEREBELLAR TUMORS.

| Series         | Tumors of the Angle |               |        |            |      |            |                  | Tumors Elsewhere |               |         |         |                 |                |            | Total |
|----------------|---------------------|---------------|--------|------------|------|------------|------------------|------------------|---------------|---------|---------|-----------------|----------------|------------|-------|
|                | Verified            |               |        |            |      |            |                  | Unverified       | Verified      |         |         |                 |                |            |       |
|                | Acoustic Neuroma    | Endothe-lioma | Glioma | Papil-loma | Cyst | Carci-noma | Acoustic Neuroma |                  | Endothe-lioma | Angioma | Osteoma | Ependy-mali-oma | Choleste-atoma | Papil-loma |       |
| Baltimore..... | 10                  | 0             | 3      | 1          | 0    | 1          | 15               | 1                | 2             | 1       | 3       | 0               | 0              | 37         |       |
| Boston.....    | 37                  | 5             | 2      | 0          | 1    | 0          | 24               | 4                | 0             | 0       | 4       | 2               | 1              | 80         |       |
| Total.....     | 47                  | 5             | 5      | 1          | 1    | 1          | 39               | 5                | 2             | 1       | 7       | 2               | 1              | 117        |       |

Case XLIV. Surg. Nos. 12291 and 13490. *An acoustic tumor of long duration. Various intranasal operations leading to ethmoidal herniation of dura. Acoustic operation with recovery. Later cerebrospinal rhinorrhoea, with fatality.*

April 20, 1920. Admission of Mr. W. H. P., age 41, a motor car salesman, who brought the following letter:

"On December 16, 1919, following the advice of the eye men whom Mr. P. had consulted, I exenterated the posterior ethmoids and both sphenoids. On the right side nothing unusual was found, except that the bone was slightly softened. No evidence of active granulation tissue, new growth or infection. On the left side there was what appeared to be at that time a dehiscence over the posterior ethmoids and the upper outer portion of the superior sphenoidal wall, brain pulsation being easily demonstrated. Very little hemorrhage. No granulation tissue or pus was demonstrated.

"Following the operation there has been a persistent muco-purulent discharge from the left side, with an increasing tumor mass, apparently from the sphenoid and the posterior ethmoidal region. This mass has gradually increased in size, and at the present time is easily demonstrable by anterior rhinoscopy. There is distinct pulsation synchronous with the heart beat. No pus has been demonstrable at any time during the last two months."

*Past History.* For 17 years total deafness in right ear. An appendectomy nine years ago. Always good general health.

*'Present' Illness.* Onset with persistent occipital headaches early in 1918, accompanied by a sense of pressure above the eyes. As the result of an ophthalmoscopic examination he was advised to have his frontal sinuses drained. This was done July 5, 1918, and at the same time the tonsils were removed as well as part of a turbinate and the septum. This was followed by "improvement."

By January 1919, the supraorbital discomforts had returned but he continued to work, though by June there was some blurring of vision, and "optic neuritis with 3-5 diopters swelling was recognized with jerky nystagmus to the right."

In August 1919, a lumbar puncture with serological and X-ray examinations—all negative.

In October 1919, he consulted several ophthalmologists and laryngologists and a neurologist. There was some conflict of opinion, but the conclusion was reached that "the present condition of the eyes, namely beginning atrophy (secondary) is in all probability due either to a brain tumor or to a hyperplastic ethmoiditis and sphenoiditis." A nasal operation was advised on the following basis: "It should be thoroughly understood that this operation may in no way influence the present condition of the optic nerve, and that it is undertaken to a certain extent as a diagnostic procedure, bearing in mind the probability that there may be an intracranial tumor which at the present time does not declare itself sufficiently for localization."

In December 1919, the ethmoid and sphenoid cells were drained and in the process of the operation a rather large piece of bone came away unexpectedly with the result stated in the letter on admission. He had "relief for about two months"—i. e., as long as he kept quiet. In February, 1920, he returned to work, but his discomforts immediately returned.

For the past four months there has been a progressive lowering of vision: his sense of smell and taste are much affected.

*Positive neurological findings. General pressure.* Slight exophthalmos with fullness of extracranial vessels. Bilateral choked disc of 3 D. subsiding with atrophy. Vision 20/30. Occipitofrontal headaches. No vomiting. A relative anosmia. The X-ray shows evidences of general pressure with beginning absorption of the sella. Frontal sinuses clouded.

*Cranial nerves.* I and II: Cf. above. III, IV and VI: Negative, though periodical diplopia noted in past history. V: Occasional "crawling" sensation of left face: objectively normal. Impairment of taste on anterior

portion of tongue, subjective and objective. VII: Slight (questionable) right facial weakness on emotional movements. VIII: Almost complete right deafness (17 years' duration) with bilateral tinnitus. IX to XII: Negative.

*Cerebellar signs.* Marked lateral nystagmus well sustained. Gait somewhat unsteady (variable.) Romberg occasionally positive. Practically no demonstrable incoordination.

In addition, the patient showed a slight, watery, nasal discharge present since his last operation and a pulsating mass could be seen far back in the left nares. This was examined for us by a specialist who reported: "Appearance is suggestive of sarcoma but is most likely a fibroma or exuberant granulation tissue frequently seen after nasal operations. Suggest that portion be snared off for pathological examination." This suggestion was not followed.

*May 4, 1920. Operation.* Usual bilateral suboccipital procedure. Respiratory difficulties under anaesthesia necessitating early puncture of ventricle. Fluid under great tension. Disclosure of typical acoustic tumor in right recess capped by unusually large multicocular arachnoid cyst. Tumor small and vascular. Partial intracapsular enucleation.

*Postoperative.* Patient made an exceptionally good recovery with complete relief of subjective discomforts. The choked disc subsided, fortunately with preservation of reading vision in his left eye. He was discharged June 4.

*Subsequent history.* He was given a series of five deep radiations (Rontgen) directed to the recess. A month after his discharge he sustained a Pott's fracture on getting out of a car. This delayed his return to work until September when he resumed his occupation and for the next two months felt perfectly well. Early in November he contracted a severe influenzal cold with bronchitis and a violent cough which confined him to bed. During one of the paroxysms (Nov. 7, 1920) there was a sudden gush of clear watery fluid from the left nostril. There has since been a persistent dripping.

*Nov. 10, 1920. Readmission.* The patient showed a normal temperature though with a persisting cough. An examination of the nose disclosed the same pulsating protrusion in the left ethmoidal region present on his former admission: dripping cerebrospinal fluid. On the third day his temperature jumped to 101° with headache and stiffness of the neck, and W. B. C. 28400. On the following day a convulsion with prolonged unconsciousness. Ventricular puncture through original site of operative perforation gave fluid containing abundant pneumococci. Increasing fever, obvious meningitis, Cheyne Stokes respiration, and death Nov. 19, 1920.

*Autopsy.* This disclosed a defect in the left ethmoidal region through which there was a dural protrusion (Figs. 1 and 2.) The protrusion contained a frontal lobe herniation and the leak, as is commonly the case, communicated directly with the ventricle (Fig. 3.)

*Comment.* Brain tumors admittedly may oftentimes be difficult of recognition and the localizing symptoms in this case were not outspoken. Still, when a patient has a choked disc it is beyond question a clear indication for a cranial decompression. Some rhinologists, however, have gone so far as to believe that a choked disc can be produced by a hyperplastic ethmoiditis, whatever that may be. That an intranasal operation in the presence of a choked disc can be regarded as a diagnostic measure, shows how far astray they have wandered from the accepted ideas of the causation of the swollen nerve head. No doubt patients with brain

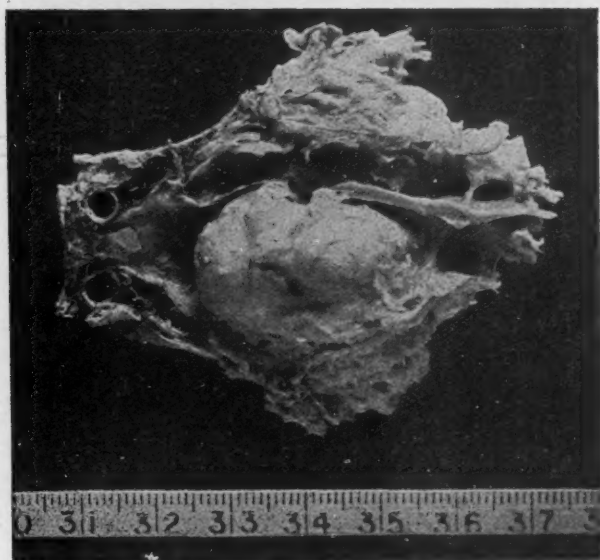
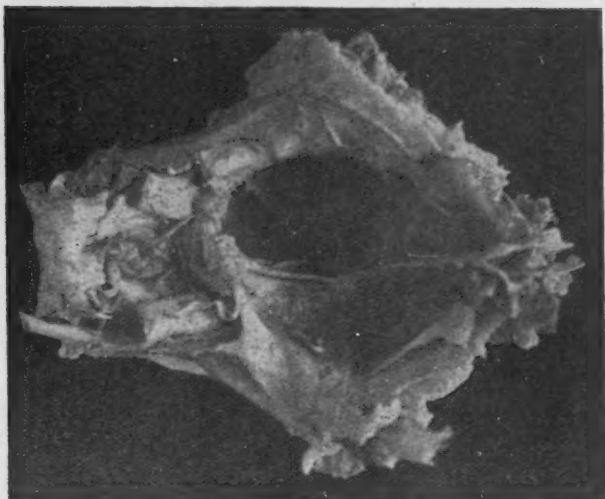


Fig. 1 and 2. Upper and lower view of block removed from Ethmoidal region of Case XLIV, showing (nat. size) the protrusion through the left ethmoidal region.



tumor may at the same time harbor an infective process in the accessory nasal sinuses which may deserve treatment, but if we are to take the position that because the diagnosis of tumor is uncertain we should therefore clean out the ethmoidal cells in the presence of choked disc, a good many patients and doctors will get in trouble.

There can be little doubt in this patient's case but that, owing to the long standing secondary hydrocephalus due to the subtentorial tumor, the cranial bones had undergone some pressure ab-

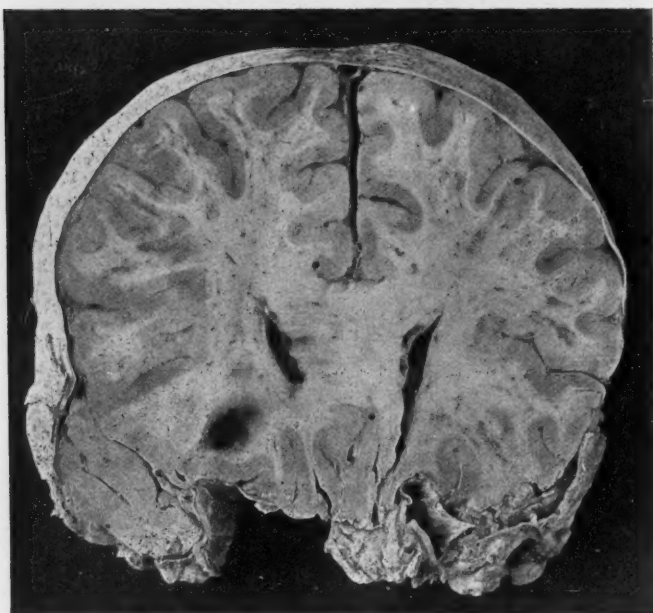


Fig. 3. Coronal section through site of herniation showing track of communication between left ventricle and the hernia.

sorption and that a pull on the wall of one of the ethmoid cells dislodged a considerable piece of the plate through which a herniation took place.

In Table 4 is given the full list of these 47 cases with their end results up to February 1, 1921. The history of each of them has its points of special interest impossible to more than touch upon. It must be taken for granted that the surviving cases have done reasonably well though unhappily one or two of the very best of

them, individuals who otherwise would be able to resume their occupations, are unable to do so owing to greatly lowered vision because of long delay.\* As has so often been said: the mere prolongation of life does not necessarily justify a surgical operation unless it is going to be better worth living. In the last column those patients sufficiently well to earn their livelihood or, if women, to conduct their household affairs, are marked with a star.

#### STATISTICS.

The surgical mortality of the first 29 cases as recorded in my monograph was 20.7 per cent. In these last 19 cases it has been 15.8 per cent. A comparison of the 11 cases in the John Hopkins series in which were four postoperative fatalities (36.3 per cent) and the 37 Brigham Hospital cases in which were five fatalities (13.5 per cent) shows even more clearly the steady improvement in operative results. This is due, of course, to two factors: (1) increased experience and (2) more precocious diagnoses, with a consequent lessening of the operative risk which is largely a matter of the anesthetic. Were one justified in eliminating from the more recent series the two cases, Nos. XXXIX and XL, which died 46 and 52 days respectively after the operation, and from other than operative complications, this would leave only one surgical fatality in the last 19 cases, namely, a 5.3 per cent mortality. This is a percentage we should at least strive to attain and when one considers that it is but a few years since a 60 per cent or higher mortality was looked upon as inevitable, it is evident that we are progressing.

#### THE FATAL CASES.

It may possibly be leaning over backward to include all deaths occurring in the hospital following operation in one's operative mortality, even if the operation may have had nothing to do with the outcome and indeed may really have prolonged life. Still it is the only possible standard and even so may not represent the full facts if patients receive an early postoperative discharge. Thus, Case XXXVII died in the Psychopathic Hospital just short

\*Several patients from the neighborhood were shown at the meeting. One of them (Case XL), a dentist, able to carry out the delicate manual work of his profession. Another (Case XLIV), in perfect physical condition, free from symptoms except for his persistent VIIIth paralysis and blindness in consequence of his long-neglected (and recognized) choked disc. He had resumed his business as a photographer nevertheless with the aid of an assistant. Another (Case XXXIX), a young man in active charge of an automobile business, who drives his own car, and shows very few residual symptoms. Though the meeting was held in November, 1920, this report has been delayed so that the chart could be completed to February, 1921, giving an interval of four years since its first publication. Since the date of the meeting, one other case, No. XLVIII, perhaps the best in the whole series, has been operated upon and is therefore included.

of two months after his operation. Had it not been necessary to send him there owing to his mental symptoms he would certainly have died under our roof. What is more, the case was one of our mistaken diagnoses and on his discharge was not even recorded as an acoustic tumor suspect. Hence, as the lesion was an unexpected post-mortem finding, it is possible that the case should not be included in this operative series at all, for there was no direct intervention. Another patient included in the tumor series (Tables 1-3) but not in the operative series (Table 4) was admitted just before I went overseas. She was referred to another clinic and died on the table.

As a matter of fact, out of our entire series of 48 cases subjected to operation, there have been only six in which the fatality could be directly ascribed to the operation, and two of these (Cases VIII and XV) were desperate secondary interventions which should not have been attempted. The fatalities have mostly occurred in advanced cases and have been attributable to early respiratory failure. Only one of them (No. 20) falls in the supplementary series of 18 cases. This was not a promising operative risk as may be judged from the letter of recommendation.

"I have a case I would like to call to your attention. \* \* \* She has completely lost her sight, hearing, sense of smell and taste. She has a constant pain in the left eye and top of head, contraction of the muscles of the right side of the face, with closing of the eye and drawing of the mouth. She cannot stand or walk, has lost flesh and is helpless. She has been treated by \* \* \* (then follows a long list of doctors and hospitals and diagnoses)."

Case XXX. Surg. No. 6278. *Advanced acoustic symptomatology. Difficult operation necessitating laminectomy of atlas. Respiratory failure the following day.*

February 17, 1917. Admission of Miss Agnes W., age 16, referred by Dr. Charles A. Church of Millsbury, Mass.

*History.* (Difficult to obtain.) Trauma to end of spine from a fall. Auditory symptoms (left) two years ago progressing to complete deafness (right and left) in 6 months. Headaches followed with gradual loss of vision to complete blindness one year ago. Staggering gait and incoordination of arms. Loss of sense of smell. Vomiting. Bedridden for six months. Amenorrhoea. She has been thoroughly morphinized. Chief discomfort: pain over left eye.

*Positive neurological findings.* Complete anosmia and ageusia. Secondary optic atrophy. Bilateral exophthalmos. Left corneal areflexia and supraorbital hypaesthesia. Left motor Vth palsy. Left VIIth palsy. Bilateral deafness total. Dysarthria. Marked cerebellar incoordination, particularly left: unable to stand alone. X-ray shows much bone thinning with absorbed sella.

March 8, 1917. *Operation.* Very difficult exposure, despite early puncture of ventricle. Anaesthetic badly taken. Marked pressure cone neces-

sitating removal of arch of atlas. Partial enucleation of large left acoustic tumor. Right recess normal.

She rallied badly from the long procedure and died the following morning from respiratory failure.

This was a desperate measure of which there is little to say except that it was undertaken too late in the story. There are two points of possible interest. One the bilateral character of the symptoms produced by a unilateral lesion, as in Case XXX (unoperated) reported in my monograph. Another matter of interest is the supraorbital pain which was one of her chief complaints. Discomforts referred to the frontal region are not at all uncommon in cerebellar cases, though they usually have a history also of suboccipital discomforts. I was at a loss to account for these frontal pains until the first occasion when I operated for an acoustic tumor under local anesthesia. The patient's condition hardly justified a general anesthetic and it was possible to carry out the usual bilateral operation and expose the tumor. However, every time it was touched or manipulated the patient cried out with pain which he referred to the frontal region on the same side, and I assume that it must be some sort of reflex pain though it possibly may be attributed to direct pressure on the trigeminal root.

In the following, the second of the fatal cases, there was unusual difficulty in arriving at a diagnosis. The patient was a feeble woman weighing below 100 pounds, who had been admitted to the medical wards with the diagnosis of exophthalmic goitre. The finding of a choked disc led to her transfer.

Case XXXIV. Surg. No. 10670. *Exophthalmic goitre with advanced acoustic tumor syndrome. Successful operation. Fatality on 46th day from inanition.*

June 19, 1919. Transfer from Medical Service of Mrs. Rose D., age 52, referred by Dr. S. S. Richmond of E. Bridgewater, Mass. for Graves' disease.

For five years the patient has had a typical exophthalmic goitre syndrome. She has been in poor health which greatly obscured the underlying intracranial lesion.

*Chronology of acoustic symptoms.* For about five years tinnitus in left ear. Two years ago ear drum opened for assumed abscess. (Patient attributed her deafness to this procedure.) One year ago same treatment of right ear owing to tinnitus, with no resultant deafness. For nine months increasingly severe occipital headache with loss of vision progressing to near blindness. Frequent changes of glasses. Occasional vomiting. Staggering gait.

*Positive findings.* Thyroid tumor with exophthalmos; advanced choked disc subsiding with atrophy; left areflexa cornealis; complete left deafness to air conduction though not to bone; ear drums thickened and retracted but without perforation. Cerebellar symptoms inconspicuous; slight nystagmus; occasional positive Romberg. Outline of sella obscured.

I felt by no means certain of the diagnosis, but at operation an acoustic tumor was disclosed and largely extirpated. She did well

for the first three weeks and there was promise of a complete recovery. There was perfect wound healing and no tension. She was well enough to be discharged, but was retained owing to marked anorexia and occasional vomiting. These symptoms grew worse and she died of inanition in the seventh week after operation.

In the third of the fatal cases there was an unusual chronology of symptoms, if one is to regard the earlier story of dizziness which preceded the deafness as actually having been occasioned by the tumor. The clinical history is given as recorded by Dr. Vail.

Case XL. Surg. No. 11977. *A fatality in an advanced case from post-operative pneumonia on the 52nd day.*

February 24, 1920. Admission of Oscar S., a steel worker, age 47, referred by Dr. Allan Greenwood of Boston.

*Present illness.* "Twenty years ago he first noticed, while at work, periodic dizziness which, though troublesome, did not put him to bed. The attacks grew worse and with them there was at times some staggering in his gait. He never noticed the direction or rotation of objects when dizzy. Stooping down or straightening up quickly would bring on the attacks: he was never dizzy when quiet or when horizontal. In short, moving around would make his dizziness worse and this would disappear upon lying down. This periodic dizziness was the first symptom and continued without other symptoms for about seven years.

"Thirteen years ago he began to have headaches. These were very severe and for two months continuous. He describes them as bursting. They were located across his eyes but with them the whole head would be sore. These severe headaches, unaccompanied by nausea or vomiting, gradually wore away and finally disappeared.

"Six months after these early headaches ceased, namely about 13 years ago, he suddenly noticed the loss of hearing in his right ear. This was not preceded by tinnitus. The degree of deafness has remained practically the same, neither improving or getting worse, so that at present he can hear only loud shouting in the right ear.

"Then for an interval of nearly 12 years, he noticed no change. He was continuously at work and felt fairly well. The dizziness and deafness did not bother him greatly and he thought himself in good condition. He saw no physician during this period.

"In May, 1919, about 10 months ago, vision in his left eye began to fail and his headaches returned, though with less severity than those of 13 years ago. The loss of vision progressed, so that at present he can see little with the left eye. Five or six months later he first noticed diminution of vision in his right eye which has slowly though steadily increased; at present he finds difficulty in reading large print and he has frequent periods of complete loss of vision (temporary amaurosis.)

"Some staggering of gait was noted from the onset of his dizziness. This was a comparatively insignificant symptom until about 5 months ago, when it increased, so that at present he often staggers and sways like a drunken man. For the past two months he has noticed a marked weakness of his arms and legs, so that one month ago he had to stop work. For the past three months there has been considerable ataxia of his hands, particularly when the dizziness has been marked. Says he would miss his mouth while eating, would be unable to pick up objects from the floor. He nevertheless only gave up work one month ago. When he would find himself getting dizzy he would drop everything and wait until this passed off.

"For the past ten months also he has noticed a stiffness of the face on the left side; also some shooting pain which begins in the left upper jaw and darts into the forehead over left eye. Thinking his teeth were at



fault he had them X-rayed and some were pulled without relief. No facial asymmetry or disturbance of taste or smell has been noted.

"In September, 1919 he consulted an eye doctor in H—— who referred him to another physician, who told him he had a growth inside of his head and gave him twelve treatments of arsenobenzol. Then he went to the H—— Hospital for two weeks, where he took six more injections, was X-rayed and had a lumbar puncture done. The fluid apparently was normal as he never received any intraspinal treatment. He left the hospital the last of November, discontinued the prescribed treatment, and on his own accord came to Boston yesterday where he was examined by Dr. Greenwood, who referred him to this hospital with a diagnosis of cerebellar tumor."

*Physical Examination.* Numerous mollusca fibrosa over neck and shoulders. Bilateral choked disc with atrophy; vision in left eye reduced to shadows. Slight exophthalmos. Palsy of left abducens. Hypaesthesia of left face. Lowered corneal sensitivity. Right facial weakness. Right deafness; incomplete. Right vestibular apparatus irresponsive. Outspoken cerebellar incoordination, particularly of right side.

*March 18, 1920. Operation.* Exceedingly difficult case due to respiratory difficulties under the anaesthetic. Usual procedure: puncture of ventricle; exposure of tumor of right recess capped by large arachnoid cyst. Thorough intracapsular enucleation.

*Postoperative.* An easy convalescence till fifth day, when a sudden rise in temperature ushered in a bilateral pneumonia. An empyaema followed. This was drained and had healed by the 16th day. He was up in a chair daily after the 25th day and died suddenly on the 52d day, cause unexplained. No autopsy permitted.

*Comment.* Here was a case in which, if we are to rely upon the patient's story, the usual chronology of symptoms did not occur. A period of vertiginous attacks and headaches preceded the usual primary auditory disturbance by fully seven years. Apart from this most unusual feature of the story certainly a diagnosis could have been made with almost certain accuracy any time in the past thirteen years. Even though the symptoms were of the "extreme" grade the condition was by no means hopeless for in many other patients in the series who have recovered the process has been similarly advanced.

On the whole, however, the risks of these operations are in direct proportion to the stage of general pressure symptoms and the percentage of fatalities will diminish step by step with more precocious diagnosis. The responsibility for this will hang primarily upon the general practitioner, secondarily upon the otologist and finally on the neurologist, who, however, is not likely to see the case until some evidences of cerebellar implication are present. The fact that in the hands of some practitioners the cases are coming to be recognized and sent to the hospital at least as "suspects" even before we can feel any real assurance ourselves as to the diagnosis is a matter of encouragement.

#### MISTAKEN DIAGNOSES.

I shall now pass on to some of our own and the neurologists' errors which, though numerous, lie in the direction of mistaking

the situation of the lesion rather than in the failure to recognize its presence.

The following note concerning one of the patients (No. XXXVI) is a good example of how a diagnosis can be missed by an imperfect record of the order of appearance of symptoms. The paragraphs are taken from the letter of the patient's physician, an expert neurologist.

"\* \* \* I saw Mrs. B— for the first time in June of this year, at which time she complained of nervousness and vomiting. I found that she had been ill for the past year and a half, during which time her symptoms were vertigo and occasional falling, always to the right, occasional attacks of vomiting, which were projectile in character and not associated with nausea.

"I also noticed that her eyesight was failing and she had peculiar sensations in and weakness of the right arm. Upon examination I found the pupils equal and dilated and reacting sluggishly to light and accommodation. She had internal strabismus and partial right facial paralysis and hyperesthesia of the right side of face, neck and right hand, slight muscular weakness of the right hand and lateral and perpendicular nystagmus. Her urine at times showed traces of sugar, no albumen and no masts. Her pulse was 84, her systolic blood pressure 134 mm. Hg., diastolic 80 mm. Hg., Wassermann negative.

"I had an ophthalmologist examine her eyes, who reported to me that he found a double choked disc. I recommended operation, but the patient was dissuaded and has since been treated by various chiropractors, osteopaths, naturopaths and other wonder-workers. She again came under my care two weeks ago and I finally persuaded her to undergo an operation."

In reply to this letter the question was asked whether the patient was deaf in her right ear. An affirmative answer that she had had tinnitus and deafness for 12 years made the diagnosis almost certain before her entrance.

The following story shows that a case may slip by with a mistaken diagnosis even in a clinic where the staff are supposedly awake to the importance of a chronologically exact history.

Case XXXVII. Surg. No. 11662. *An acoustic tumor mistaken first for arteriosclerosis and later for a frontal tumor.*

December 15, 1919. Admission of Willard C., a janitor 58 years of age, referred by Dr. Arthur Cushing of Brookline, Mass., with the complaint of failing vision for 18 months.

*Past History.* This brought out the facts that he had had two serious injuries 41 and 15 years previous, one a fracture of the femur, the other a blow on the head.

**Present Illness.** Falling vision for 18 months which he has attributed to his age. Frequent change of glasses. For 8 months periods of amaurosis. For 6 months 'spells' of dizziness and double vision after a hard day's work. He ascribes this to excessive use of tobacco. He has worked steadily up to the day of his admission. No headaches.

**Physical Examination.** Bilateral choked disc. Marked deafness in right ear: high notes of Galton whistle heard. No cerebellar symptoms detected. Station and gait normal: no nystagmus.\*

**Diagnosis.** There was some arterial hypertension and this with the patient's age led to a presumptive diagnosis of cerebral arteriosclerosis. He was, however, regarded as a brain tumor suspect.

**Dec. 31, 1919. Operation I.** A right subtemporal decompression was performed by one of my assistants, disclosing a tense brain. An exploratory puncture of the ventricle was negative. The cortical vessels showed no sclerosis.

Convalescence was stormy with mental confusion and a serious cardiac upset. The swelling of the optic nerves increased. The decompression became increasingly tense. He developed what was thought to be an asteriognosis of the left hand; and tests of his fields were thought to show a left homonymous hemianopsia.

**Jan. 20, 1920. Operation II.** Right osteoplastic exploration of hemisphere with negative findings except for tension due to internal hydrocephalus.

Following the operation he became unmanageable, and on Feb. 5th was transferred to the Psychopathic Hospital, where he died three weeks later. Autopsy disclosed a right acoustic tumor. It was not until this finding that on reviewing the history it was found to have been clearly stated that for 15 years he had been deaf in his right ear—a fact attributed by the patient to deep diving. The significance of this note appears to have been entirely overlooked by all who had gone over the case.

**Comment.** This was a very bad break and despite the patient's age and cardiovascular changes which threw us off the track, it is inconceivable how the diagnostic error could have been made, for though the case was an early one and the cerebellar symptoms inconspicuous, nevertheless there was enough to make the diagnosis unquestionable had not the long-standing deafness been disregarded. The experience serves to show how difficult it may be at times to distinguish between a cerebral and a cerebellar lesion, and how important it is in assembling the historical data and the positive neurological findings to get them in their proper order. The case shows, too, how upsetting a misdirected cerebral exploration may be when there is a posterior lesion causing hydrocephalus. The finding of hydrocephalus should unquestionably have led to the suspicion of a posterior lesion even in the absence of a unilateral deafness.

The other fourteen patients in this recent supplementary series have for the most part given straightforward and unmistakable clinical histories of acoustic tumor and their operations have been conducted without undue difficulty and with uniformly satisfactory outcomes. A number of the patients, however, have been subjected

\*It should be admitted that another examiner recorded a positive Romberg and a slightly insensitive right cornea. Still another observer thought there was slight nystagmus.

to a prolonged period of therapeutic procrastination. Most of them have passed through the hands of otologists who in the future will, I trust, come to regard with suspicion a unilateral tinnitus and deafness coming on without assignable cause. The clinical story from a single history may be briefly cited.

Case XLIII. Surg. No. 12330. *Admission April 27, 1920.* Nine years before entrance (i. e., 1911) the patient noted a roaring tinnitus and some difficulty of hearing in his left ear. It was ascribed to a cold in the head and was treated for one year as a catarrhal otitis by an otologist who used repeated insufflation. By the end of that time (1912) he had become exceedingly deaf. He then consulted another ear specialist in a distant city who said the drum was flat and the Eustachian tube closed. With a snare he removed the projections of each tube from the pharyngeal fossae. Subsequently he became "stone deaf" in the left ear but a hissing tinnitus has persisted to the present time.

In 1911 also he began having periodic headaches radiating from frontal to occipital regions. They have steadily increased in number and intensity, becoming severe and accompanied by vomiting the past year.

In 1912 he first noted some impairment of vision. At this time he had a submucous resection of the vomer because of a spur supposed to be the possible cause of his trouble. Despite frequent changes of glasses vision slowly failed. In 1913 his turbinates were removed, which did not check the process, and vision was completely lost a year ago.

In 1915 he first noticed dizziness and unsteadiness and on turning quickly would stagger. Since 1918 he has had to give up all forms of outdoor exercise, of which he was fond. His gait has become so unsteady he is now unable to walk alone and has often fallen.

Other examples of this same sort might be given from this series of cases, though perhaps none quite so calamitous as this. Still this story and that of the patient made the chief text of this paper will serve to show why a neurosurgeon, freely admitting his own errors of judgment, nevertheless has felt impelled to point out some of the common mistakes on the part of other specialists which appear in the records of these cases.

#### DIFFERENTIAL DIAGNOSIS.

A number of case reports were given in my monograph illustrating lesions in and about the cerebellopontile angle which might give symptoms easily confused with primary acoustic tumors. It was pointed out, however, that although these conditions on their existent symptomatology might easily be mistaken for acoustic tumors, they usually could be clearly differentiated from them on the basis of symptomatic sequence, for in the acoustic cases practically without exception the auditory disturbance was the antecedent phenomenon—often long antecedent.

There have been two cases, however, during the past few years with histories which were completely misleading. The first of these proved to be an *endothelioma of the Gasserian envelopes* which had crowded its way through to the posterior fossa. Her clinical history in brief was as follows.

TABLE IV. RECORD OF ACOUSTIC NEURO

| Case No. | On First Admission             |                   |                | Operations     |     |                        |
|----------|--------------------------------|-------------------|----------------|----------------|-----|------------------------|
|          | Recorded Ear Symptoms Duration | Pressure Duration | Syndrome Stage | Date           | No. | Character              |
| 1        | Many years                     | 3 years           | Extreme        | Jan. 18, 1906  | 1   | 1st stage exploration  |
| 2        | Several years                  | 9 months          | Extreme        | Apr. 3, 1906   | 1   | Partial enucleation    |
| 3        | 4 years                        | 3 years           | Advanced       | Sept. 15, 1906 | 1   | Partial enucleation    |
| 4        | 9 years                        | 4 years           | Extreme        | Mar. 6, 1909   | 1   | Primary exposure       |
| 5        | 7 years                        | 1 year            | Extreme        | Apr. 23, 1909  | 2   | Cyst evacuation        |
|          |                                |                   |                | May 21, 1909   | 1   | Radical enucleation    |
|          |                                |                   |                | Nov. 21, 1912  | 2   | Radical recurrence     |
| 6        | 5 years                        | 3 years           | Advanced       | Jan. 27, 1910  | 1   | Partial enucleation    |
| 7        | 1.5 years                      | 1.5 years         | Advanced       | June 4, 1910   | 1   | Exploration and deco   |
| 8        | 2.5 years                      | 1 year            | Advanced       | Jan. 4, 1911   | 1   | Tumor exposure         |
|          |                                |                   |                | Mar. 6, 1911   | 2   | Partial extirpation    |
|          |                                |                   |                | Apr. 1, 1911   | 3   | Radical extirpation    |
| 9        | 10 years                       | 2 years           | Advanced       | Oct. 17, 1910  | 1   | Attempted extirpation  |
| 10       | 4 years                        | 3 years           | Advanced       | Apr. 27, 1911  | 1   | Attempted extirpation  |
| 11       | 4 years                        | 2.5 years         | Advanced       | May 1, 1911    | 1   | Partial extirpation    |
|          |                                |                   |                | June 2, 1911   | 2   | Radical extirpation    |
|          |                                |                   |                | Sept. 6, 1913  | 1   | Partial enucleation    |
| 12       | 2 years                        | 8 months          | Advanced       | Oct. 17, 1913  | 2   | Extensive enucleation  |
|          |                                |                   |                | Dec. 23, 1913  | 1   | Partial enucleation    |
| 13       | 7 years                        | 6 months          | Medium         | Mar. 12, 1914  | 1   | Exploration and deco   |
| 28       | 3 years                        | 1.5 years         | Medium         | May 5, 1915    | 2   | Negative exploration   |
|          |                                |                   |                | Jan. 22, 1917  | 3   | Extensive enucleation  |
|          |                                |                   |                | Nov. 10, 1914  | 1   | Partial enucleation    |
| 14       | 2 years                        | 1.5 years         | Advanced       | Nov. 23, 1914  | 1   | Exploration and deco   |
| 15       | 2 years                        | 1 year            | Extreme        | Feb. 12, 1915  | 2   | Exploration and deco   |
|          |                                |                   |                | May 21, 1915   | 1   | Radical enucleation    |
| 16       | 1.5 years                      | 1 year            | Extreme        | June 22, 1915  | 1   | Radical enucleation    |
| 17       | 3 years                        | 6 months          | Extreme        | June 13, 1915  | 1   | Partial enucleation    |
| 18       | 4.5 years                      | 4 months          | Advanced       | Sept. 4, 1915  | 1   | Attempted extirpation  |
| 19       | 3 years                        | 2 years           | Extreme        | Oct. 7, 1915   | 1   | Partial enucleation    |
| 20       | 4 years                        | 1.5 years         | Advanced       | Oct. 5, 1915   | 1   | Partial enucleation    |
| 21       | 5 years                        | 1.5 years         | Advanced       | Jan. 22, 1916  | 1   | Extensive enucleation  |
| 22       | 9 years                        | 1 year            | Advanced       | Apr. 20, 1916  | 1   | Fragmentary enucleat   |
| 23       | 2 years                        | 2 years           | Advanced       | Oct. 13, 1916  | 1   | Partial enucleation    |
| 24       | 2.5 years                      | 1 year            | Advanced       | Jan. 15, 1917  | 2   | Extensive enucleation  |
|          |                                |                   |                | Nov. 6, 1916   | 1   | Extensive enucleation  |
| 25       | 6 months                       | 6 months          | Advanced       | No. 23, 1916   | 1   | Fragmentary enucleat   |
| 26       | 2 years                        | 6 months          | Medium         | Dec. 26, 1916  | 1   | Partial enucleation    |
| 27       | 1 year                         | 1 year            | Advanced       | Jan. 26, 1917  | 1   | Extensive enucleation  |
| 29       | 3 years                        | 2 years           | Advanced       | Mar. 8, 1917   | 1   | Partial enucleation    |
| 30       | 2 years                        | 14 months         | Extreme—Blind  | Mar. 13, 1917  | 1   | Extensive enucleation  |
| 31       | 4 years*                       | 1 year            | Extreme        | Mar. 16, 1917  | 1   | Extensive enucleation  |
| 32       | 4 years                        | 3 years           | Extreme        | Apr. 7, 1917   | 1   | Partial enucleation    |
| 33       | 4 yrs.*—abrupt                 | 4 years           | Extreme        | July 9, 1919   | 1   | Extensive enucleation  |
| 34       | 5 years                        | 9 months          | Medium         | Aug. 29, 1919  | 1   | Extensive enucleation  |
| 35       | 4 years                        | 3 years           | Medium         | Dec. 1, 1919   | 1   | Extensive enucleation  |
| 36       | 12 years                       | 1.5 years         | Extreme        | Dec. 31, 1919  | 1   | Rt. subtemporal deco   |
| 37       | 15 years                       | 18 months         | Extreme        | Jan. 20, 1920  | 2   | Rt. parietal bone flap |
|          |                                |                   |                |                |     | Internal hydrocephalus |
| 38       | 5 years                        | 2 months          | Medium         | Jan. 5, 1920   | 1   | Rt. subtemporal deco   |
|          |                                |                   |                | Jan. 23, 1920  | 2   | Extensive enucleation  |
| 39       | 7 years                        | 4 months          | Advanced       | Jan. 24, 1920  | 1   | Partial enucleation    |
| 40       | 14 years                       | 1 year            | Extreme        | Mar. 18, 1920  | 1   | Partial enucleation    |
| 41       | 5 years                        | 1 year            | Advanced       | Apr. 22, 1920  | 1   | Extensive enucleation  |
| 42       | 1 year (?)                     | 1 year            | Advanced       | Apr. 23, 1920  | 1   | Extensive enucleation  |
| 43       | 9 years                        | 5 years           | Advanced       | Apr. 30, 1920  | 1   | Extensive enucleation  |
| 44       | 17 years                       | 2 years           | Medium         | May 4, 1920    | 1   | Fragmentary enucleat   |
| 45       | 9 years                        | 7 months          | Advanced       | May 24, 1920   | 1   | Partial enucleation    |
| 46       | 1 year                         | 16 months         | Advanced       | June 26, 1920  | 1   | Extensive enucleation  |
| 47       | 10 years                       | 2.5 years         | Advanced       | Oct. 4, 1920   | 1   | Nearly total           |
| 48       | 2 years                        | 6 years           | Early          | Jan. 31, 1921  | 1   | Nearly total           |



## V. RECORD OF ACOUSTIC NEUROMA CASES TO FEBRUARY 1, 1921.

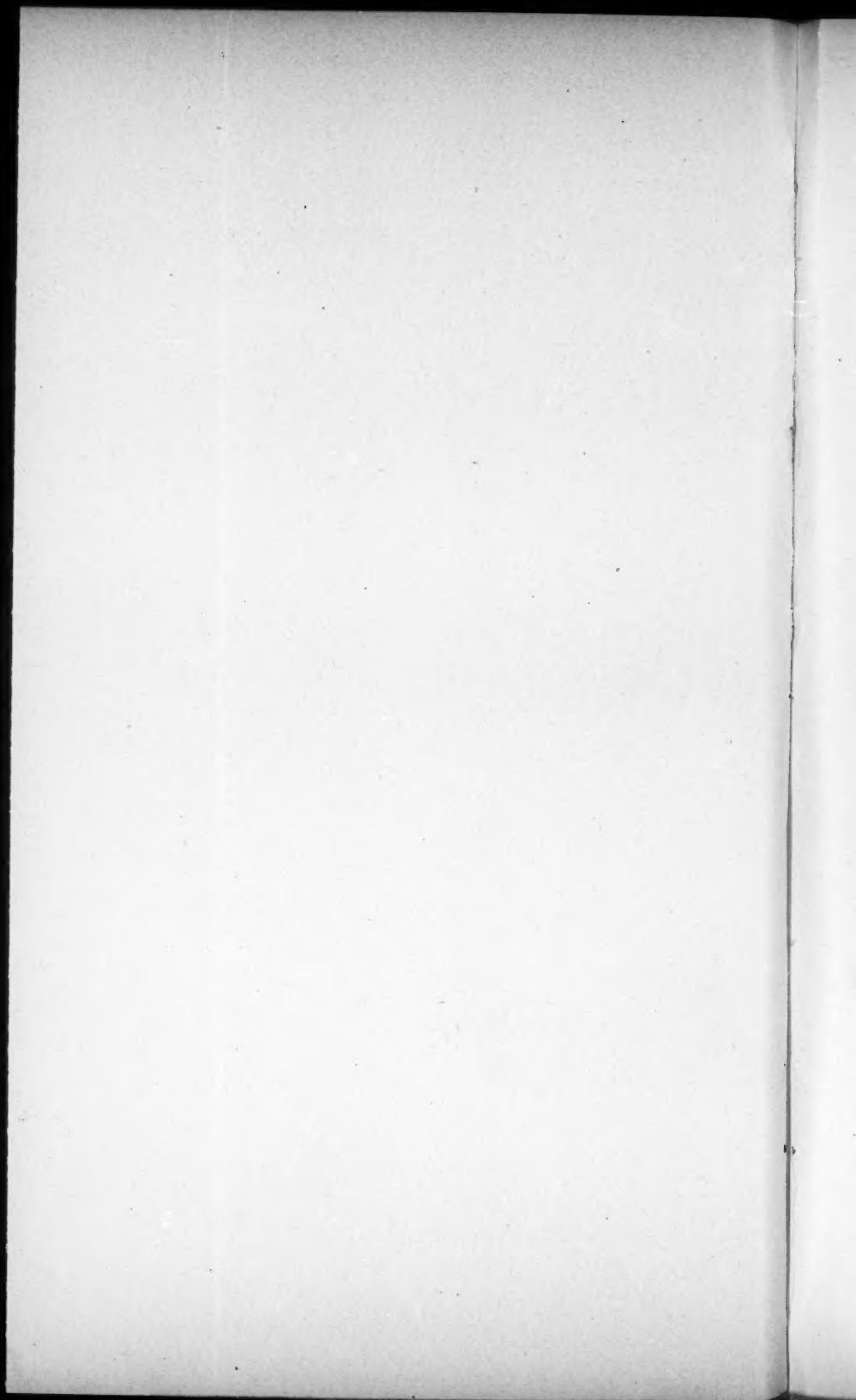
| Case No. | Operations |                               | Post-Operative Fatality  |
|----------|------------|-------------------------------|--|
|          | No.        | Character                     |  |
| 1906     | 1          | 1st stage exploration         | 3rd day; pneumonia   |
| 1906     | 1          | Partial enucleation           |  |
| 1906     | 1          | Partial enucleation           |  |
| 1909     | 1          | Primary exposure              |  |
| 1909     | 2          | Cyst evacuation               |  |
| 1909     | 1          | Radical enucleation           |  |
| 1912     | 2          | Radical recurrence            |  |
| 1910     | 1          | Partial enucleation           |  |
| 1910     | 1          | Exploration and decompression |  |
| 1911     | 1          | Tumor exposure                |  |
| 1911     | 2          | Partial extirpation           | 36 hours; shock<br>1 hour; respiratory failure<br>6th day; pneumonia |
| 1911     | 3          | Radical extirpation           |  |
| 1910     | 1          | Attempted extirpation         |  |
| 1911     | 1          | Attempted extirpation         |  |
| 1911     | 1          | Partial extirpation           |  |
| 1911     | 2          | Radical extirpation           |  |
| 1913     | 1          | Partial enucleation           |  |
| 1913     | 2          | Extensive enucleation         |  |
| 1913     | 1          | Partial enucleation           |  |
| 1914     | 1          | Exploration and decompression |  |
| 1915     | 2          | Negative exploration          | 10 hrs.; respiratory failure   |
| 1917     | 3          | Extensive enucleation         |  |
| 1914     | 1          | Partial enucleation           |  |
| 1914     | 1          | Exploration and decompression |  |
| 1915     | 2          | Exploration and decompression |  |
| 1915     | 1          | Radical enucleation           |  |
| 1915     | 1          | Radical enucleation           |  |
| 1915     | 1          | Partial enucleation           |  |
| 1915     | 1          | Attempted extirpation         |  |
| 1915     | 1          | Partial enucleation           |  |
| 1915     | 1          | Partial enucleation           | 6th day; pneumonia   |
| 1916     | 1          | Extensive enucleation         |  |
| 1916     | 1          | Fragmentary enucleation       |  |
| 1916     | 1          | Partial enucleation           |  |
| 1917     | 2          | Extensive enucleation         |  |
| 1916     | 1          | Extensive enucleation         |  |
| 1916     | 1          | Fragmentary enucleation       |  |
| 1916     | 1          | Partial enucleation           |  |
| 1917     | 1          | Extensive enucleation         |  |
| 1917     | 1          | Partial enucleation           |  |
| 1917     | 1          | Partial enucleation           | 2nd day; respiratory failure   |
| 1917     | 1          | Extensive enucleation         |  |
| 1917     | 1          | Extensive enucleation         |  |
| 1917     | 1          | Partial enucleation           |  |
| 1919     | 1          | Extensive enucleation         |  |
| 1919     | 1          | Extensive enucleation         |  |
| 1919     | 1          | Extensive enucleation         |  |
| 1919     | 1          | Rt. subtemporal decompression |  |
| 1919     | 1          | Rt. parietal bone flap        |  |
| 1920     | 2          | Internal hydrocephalus        |  |
| 1920     | 1          | Rt. subtemporal decompression | 46th day; inanition  |
| 1920     | 2          | Extensive enucleation         |  |
| 1920     | 1          | Partial enucleation           |  |
| 1920     | 1          | Partial enucleation           |  |
| 1920     | 1          | Extensive enucleation         |  |
| 1920     | 1          | Extensive enucleation         |  |
| 1920     | 1          | Extensive enucleation         |  |
| 1920     | 1          | Fragmentary enucleation       |  |
| 1920     | 1          | Partial enucleation           |  |
| 1920     | 1          | Extensive enucleation         |  |
| 1920     | 1          | Nearly total                  | 52nd day; pneumonia  |
| 1921     | 1          | Nearly total                  |  |

Y 1, 1921.

| Pre Fatality                 | Survival Period<br>after First<br>Operation | Living from First<br>Operation to Feb. 1,<br>1921                                 |
|------------------------------|---|---|
| monia                        | 3 years, 8 months<br>3 years, 7 months      | *11 years, 11 months<br>*11 years, 9 months                                       |
| ck<br>atory failure<br>monia | 6 years, 7 months<br>11 months              | 9 years, 9 months   |
| atory failure                | 5 years, 4 months                           | *7 years, 1 month<br>*6 years, 11 months<br>*6 years, 3 months                    |
| umonia                       | 4 years, 9 months                           | 5 years, 9 months<br>5 years, 8 months<br>*5 years, 8 months                      |
| piratory failure             | 1 year, 3 months                            | 5 years, 4 months<br>*5 years<br>4 years, 4 months                                |
|                              | 1 year, 8 months                            | *4 years, 3 months<br>*4 years, 1 month<br>*4 years                               |
| anition                      | 3 years, 4 months*                          | 3 years, 11 months  |
|                              | 11 months                                   | *1 year, 5 months<br>1 year, 2 months   |
|                              | 1 month, 25 days                            | *1 year, 1 month<br>*1 year   |
| neumonia                     | 6 months**                                  | 9 months<br>*9 months<br>*9 months<br>8 months<br>7 months<br>4 months<br>0 month |

\*Influenzal pneumonia.

\*\*Complication of nasal operation.



Surg. No. 11457. *Chronology of symptoms.* For 18 months left tinnitus followed in 6 months by deafness. For 12 months pain in the left trigeminal area increasing in severity. For three months diplopia and numbness of left forehead.

*Positive neurological findings.* Slight left ptosis. Left pupil larger than right. Left abducens palsy. Left areflexia and relative insensitivity in skin fields of 1st and 2d left trigeminal divisions. Left facial weakness (slight.) No cerebellar symptoms, though a few nystagmoid jerks to right. No choked disc, though nasal margins blurred. No headache.

This poor woman had consulted many specialists: had had repeated inflations of the ear; had been treated for a year for facial "neuritis": had taken muscle exercises for her ophthalmoplegia: had had two or three nasal operations and a period of "rest



Fig. 4. Cystic glioma of pons giving symptoms close resembling an acoustic neuroma.

treatment." It was difficult to tell whether she should have a suboccipital or temporal exploration but the decision fortunately was in favor of the latter, although in Gasserian endotheliomas the inaugural symptoms are usually trigeminal as has been fully emphasized by Cadwalader. An endothelioma was found and partially removed; the trigeminal root was also divided. Her pain has ceased and she has done exceptionally well, being free from pain and with the probability that many years may intervene before there is serious progress of the growth.

In the other case which may deserve mention, one of *pontile glioma originating (?) in the VIIIth nucleus*, (Fig. 4) we were

completely fooled. A diagnosis of acoustic neuroma was made with operation and fatal issue. The case will be reported in full elsewhere.

#### THE SURGICAL PROCEDURE.

I am quite aware that the operation which has been described as the one I am most capable of seeing through with a reasonable measure of safety is not to be regarded as a cure even though life may be prolonged, vision saved, discomforts lessened, and, as the starred cases in Table 4 will show, even though a considerable percentage of the survivors may be able to return to a satisfactory wage-earning basis. I gather from the reports of some other surgeons that they attribute their high mortality to the attempt to remove the tumor in its totality. This is a temptation difficult to resist when one is in the presence of a well exposed so-called enucleable tumor of the recess. It is possible that someone may some day be able to completely enucleate one of these lesions, but it is not likely until earlier diagnoses are made and tumors of smaller size are exposed. When that desired time comes it will be quite possible to divide the nerve on the proximal side of the growth and with a proper spoon to scoup out the stalk of the lesion which projects into the porus acusticus. But even under these favorable circumstances a thorough eradication will almost certainly produce a permanent facial paralysis. With tumors of the size which the surgeon of the present day inevitably encounters—tumors which deform the pons and medulla, and which not only have large vessels lying over them but which are wrapped about by important nerves, such a procedure as the attempt to shell them out in toto would be foolhardy in the extreme, especially when one realizes that they are attached to pons and porus by the relic of the nerve from which they have grown.

That the intracapsular enucleation as practiced in this clinic is often very incomplete needs no saying. The thoroughness with which it may be done depends largely on the softness of the growth, in other words, upon the degree of fatty degeneration which it has undergone. When this is extreme one may, with a blunt spoon, almost completely remove it, but when the fibrous elements are abundant and the growth is vascular a large part of the lesion may have to be left in situ and the chief benefit of the operation will then depend alone upon the effect of the wide decompression.

I do not know of anyone who has definitely operated on one of these tumors before pressure symptoms have supervened, and these



indicate the presence of a certain degree of internal hydrocephalus due to pressure against the pons, to narrowing of the iter, or to a reaction of the meninges around the tentorial opening for the brain stem which prevents fluid from passing out of the arachnoid spaces in the cerebellar chamber up over the cerebrum. Either of these things leads to a fluid stasis and a hydrocephalus, and by the time this has occurred the growth in all certainty will have reached a large enough size to have provoked symptoms other than those attributable to the destruction of the N. acusticus itself. These are essentially cerebellar symptoms.

We will have advanced in our surgical procedures farther than we now have done before an operation for an acoustic tumor can be advocated, when it is in a stage affecting hearing alone, even if we can be certain of our diagnosis at that time. Let us take for example the case of the young man (Case XLIV) recorded at the outset of this report. The fact that he had a nerve deafness for approximately seventeen years before any pressure symptoms arose might have made a diagnosis possible had he chanced to consult an otologist familiar with these tumors. But I am very doubtful whether anyone would have been justified in the present stage of neuro-surgery in advocating an operation at any time during the course of these seventeen years, basing this advice on the possibility or even certainty that some day the tumor might grow to such a size as to provoke serious symptoms. In short, it is unlikely, for a long time to come, that operations for these lesions will be undertaken before some general pressure symptoms supervene.

This may appear to be an over-conservative opinion, but there is no belittling the fact that recess operations even in the absence of pressure symptoms are ticklish affairs and also that, as in the case cited, many of these tumors may remain symptomatically dormant for years after the first auditory symptoms have indicated their existence. Certainly during this latent period we can at least spare the patient from meddlesome surgery in the futile effort to restore the hearing. And when the first pressure symptoms do actually supervene a direct attack on the lesion can be made without delay and without groping in an ethmoidal darkness in the vain hope of relieving the early disturbances of vision produced by the abnormal increase of intracranial tension.

The preferential method of approaching and attacking these lesions at operation was fully discussed in my monograph and needs no further comment. In a recent interesting presentation of the

question,\* Mr. J. S. Fraser who naturally looks upon the subject from the otologist's point of view, appears to advocate the translabyrinthine operation. The otologist doubtless will be the first to recognize and diagnose these cases, for the majority of the patients will unquestionably consult him before a neurologist and long before a surgeon. But if the otologist has surgical ambitions to treat these lesions there is no possible route more dangerous or difficult than this one which has been proposed by Panse, Quix and Schmiegelow.

It is said that the only objection to the translabyrinthine route is the inevitable destruction of the facial nerve, but this is set aside on the grounds that in many cases it has already been destroyed. This statement is misleading, for facial paralysis is extremely rare. If the otologist can come to recognize these cases at a time when the growth is really enucleable, and feels justified in advising operation, he will have a much greater chance of success in its removal by an attack from behind and within which makes wound closure possible and provides for a decompression, than by an attack through the cramped quarters of the mastoid with its impossibility of determining the size of the intracranial extension of the tumor, with the difficulty of controlling intracranial hemorrhage should it occur, and with the almost inevitable subsequent cerebrospinal fluid leak. A proposal of this sort I am sure would never occur to an otologist who had had a general surgical training before he engaged in the particular surgery of his specialty.\*\*

\*Tumors of the Eighth Nerve. Proc. of the Roy Soc. of Med., 1920, XIII (Section of Otology) pp 109-157.

\*\*It has long been our custom after these operations to subject the affected recess containing the remains of the lesion to deep radiations with the X-ray. This can do no harm and may be a supplementary form of treatment which will tend to discourage a resumption of activity in the remaining fragment, though of this as yet there is no certainty.

## CULTIVATING THE BALANCE SENSE: A PRELUDE TO CLOUD FLYING.\*

DR. ROBERT J. HUNTER, Philadelphia.

As the war advanced, bombing by night and day and long-distance raids, made possible by the improvements in planes, assumed a steadily increasing importance. Bombing pilots had to be able to navigate their ship to a given objective, under cover of darkness, or through and above the clouds in daytime. Aviators find it difficult to fly in the clouds. Some men who fly safely in the open are totally unable to navigate in a cloud, and sometimes they go into a tail spin.

Lieut. Commander A. C. Read, United States Navy, of the *N-C4*, says in the personal account of his experience, as printed in the *Philadelphia Inquirer*:

"At 6:55 (a. m.) we passed over a merchant ship, and at 8 o'clock we saw our first indications of possible trouble, running through light lumps of fog. It cleared at 8:12, but at 9:27 we ran into more fog for a few minutes. At 9:45 the fog became thicker and then dense. The sun disappeared and we lost all sense of direction. The compass spinning indicated a steep bank and I had visions of a possible nose dive. Then the sun appeared and the blue sky once more, and we regained an even keel and put the plane on a course above the fog, flying between the fog and an upper layer of clouds. We caught occasional glimpses of the water, so we climbed to 3,200 feet, occasionally changing the course and the altitude to dodge the clouds and fog."

This is an intensely interesting report to me, and the method of instruction I am advocating may eliminate such fears. Analyzing the report we find that the compass spinning indicated a steep bank or tilt to one side. In other words, the aviator chosen for his superior skill to make this historic trip was unable when in the fog bank to perceive that the ship was off an even keel, and the spinning of the compass was what called Commander Read's attention to their faulty position. "I had visions of a possible nose dive." If the steep bank into which the *N-C4* was placed in the fog, had become more marked and the aviator, not perceiving it, had not ruddered into it properly, a side slip would have occurred, and this, if not stopped, might have resulted in a tail spin. These heavy boats do not spin easily. They are more likely to dive. You will notice

\*Read (by invitation) before the Section on Otology and Laryngology of the College of Physicians, of Philadelphia, on May 21, 1919.

that it was only when the sun appeared that the ship was righted and that the danger was sufficient to cause them to change their course and to climb to a higher altitude in order to have a chance to maneuver in case of an accident. "We lost all sense of direction." The direction could easily have been maintained by the compass. It was the balance sense that was confused, also. Many men have told me there is a tendency to nose up (climb upward) in a cloud, and it is a common practice to listen to the engine to hear if it is laboring with the strain of climbing, and to the purr of the wires to judge whether speed is being gathered by an inclination downward. The same difficulties apply to night flying, if the stars and moon are obscured and the aviator cannot see the ground. Any technique that would even partly remedy this danger would be a distinct advance.

In ordinary daylight flying an aviator keeps his ship in position by his sense of sight, his balance sense, his muscle sense, and deep sensibility tracts. He gets some information from the wind through his tactile sense and the engine and wires through his sense of hearing. The most important of these, by far, are sight and balance. On a dark starless and moonless night and in a cloud sight is cut off. In a cloud the feel of the wind on the face is also lessened. In both cases the aviator depends almost entirely on his balance sense, coming from vestibular impulses, to keep in flying position.

We know that any of the senses may be highly cultivated by practice or by calling on them to compensate for the loss of another sense. Blind men were used in London during the war to help locate the Gothas. They could hear them quickly and detect the direction better than men with sight. Silk workers in India detect the slightest variation in thickness with great skill, through the development of their tactile sense. Tea and brandy tasters for the trade have the sense of taste trained. Many here tonight recall the blind man who for years delivered provisions in the downtown section of this city. He was a notorious character. I remember well his queer call and especially the wonderful accuracy with which he found his way through the street. His sense of direction was highly trained.

The thought of having men walk while blindfolded in a straight line and later perform some evolutions and observing whether they improved after a reasonable length of training had occurred to me as a means to train the sense of direction, but I abandoned it as not practicable, because aviators in a cloud can see their compass and

are not interested so much in keeping in a straight line as in maintaining their flying position and thus avoiding a fall. I then began to consider the question of flying while blindfolded to improve the "feel of the ship" as it is called; the balance sense. About this time, September, 1918, Maj. H. R. Raikes, R. A. F., a member of the British Aviation Mission, came to Ellington Field and suggested a compass course in flying, to train men in cross-country work. I took up the matter with him and he thought the plan of flying blindfolded as a part of an aviator's training had some practical possibilities.

Two-seated planes were selected with double control. That is, the plane could be managed from either seat. The pupil sat in the front seat beneath a black hood like that on a baby carriage. It fastened at the top with a catch to which a string was tied. A pull of the string released the catch and the hood flew open again. The linen on the fuselage (body) was painted black to keep out the light. The instructor sat in the open, in the back seat, ready to fly the plane if necessary and observing the facility with which the pupil held his course while seated beneath the hood. The pupil was to maintain his flying position by watching an inclinometer and a level.

I took some rides under this cover, but found the light coming up through the floor and under the instrument board so good that it was unnecessary to use the lamp to see the compass. I then tried holding the eyes shut, but there was a constant tendency to open them. A velvet mask was then made to fit over the goggles in such a way as to keep out all light and be removed from the eyes quickly by simply pushing the goggles up on the forehead. The hood kept the wind from the face. I also tried flying with wax plugging the ears, to cut off the sound of the engine, but the noise was not lessened enough to make it worth while, and as it was very unpleasant, I abandoned it. Before having the men attempt to fly I went up blindfolded to observe whether one could tell the position of the ship with sufficient accuracy. The pilot was instructed to begin his evolutions by making the slightest possible deviations. As we had no intercommunicating phones I held cords tied to the aviator's arms and by prearranged signals let him know as soon as I perceived any deviation from the normal flying position. We soon found that I could tell if the nose went up or down instantly. I could tell quickly when we flew with one wing or the other low; but I made some mistakes when we banked and turned at the same time. Any marked change of position could be detected easily.

The accompanying blank was then devised for charting all positions of the plane with check marks. The idea being to have a man fly blindfolded for ten minutes each day for about two weeks and see if he improved any. If such was the case I thought it would give him greater confidence while in the clouds and he would learn that he had the ability to keep an even keel without the aid of eyesight. Instead of acquiring this ability by practice in a cloud, he practiced on a clear day with a trusty instructor to take control if necessary and correct his defects. He was to attempt no evolutions, but simply to keep the ship in good flying position. Unfortunately I was ordered away for six weeks just at this time and the armistice was signed soon after. When I returned I found that the blindfold flying had not been carried out, but that the men showed improvement in their compass flying under the hood after a few lessons. One man who was a fair flyer in the open was very poor under cover; had to be given the course twice and was then far from satisfactory.

I regret that I have no report to make of the results of such a course of training.

*Conclusion.* Knowing that other special senses are susceptible of high development through training, a priori, we must conclude that the balance mechanism is also.

The point that we have not proven is, How long would it take to make a man confident in a fog and would the training period be so long as to be impracticable for a course in an army aviation school?\*

In spite of the small air service that has been retained and the lack of government help in developing commercial aviation, airplane design and engine models have improved considerably since the war. In time, no doubt, proper instruments will be developed to make the operation of an airplane very safe. At present the best method for judging position seems to be the combined use of a gyroscopic turn indicator and an inclinometer. Given progress in a straight line, the gyroscope registers either right or left when a turn is made. It is said that the gyroscope shows the turning movement immediately and continues to register for about eighteen minutes. In banks and turns, centrifugal force will keep the compass needle from properly registering, therefore, once the airplane begins to turn, the compass is of no value as an indicator of direction. In laying a course to the north, the magnetic pole causes a

\*Reprint from Air Service Information Circular, Vol. 1, No. 3, March 15, 1920. Compiled by Medical Division, Air Service, Washington, D. C.



variation in the needle to such an extent that it is difficult to fly a straight course by the compass, especially if one is climbing or descending.

I am not sure how much information an aviator gets from his deep sensibility, muscle and joint sense combined with his balance sense. These are interpreted in relation to his seat in the plane. In a turn made with perfect bank, it is difficult to tell one's position because of the perfect interadjustment of centrifugal force and gravity. It has occurred to me that the feeling of resistance on the controls may impart some information as to the position of the ship, but I do not believe that it is an important factor.

Some men have spoken of a sense of lightness or heaviness during certain evolutions, as when diving rapidly or turning. These are, I should think, registered through the deep sensibility and muscle tracts, and are due to varying degrees of the pull of gravity and centrifugal force.

At present the sense of balance is the aviator's greatest safeguard in a cloud and any particular method of cultivating it is still of value.

1825 Chestnut Street.

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#### OPEN SAFETY PIN IN LARYNX. SIX MONTHS.\*

DR. HENRY BOYLAN ORTON, Newark, New Jersey.

Lillie C., aged 6 years, white, admitted to Saint Michael's Hospital, Newark, N. J., August 24, 1920, with complaint of difficulty in breathing.

*Past History.* Had whooping cough at the age of 1 year, measles when 5 years old, and diphtheria six months ago. Has otherwise enjoyed good health up until six months ago.

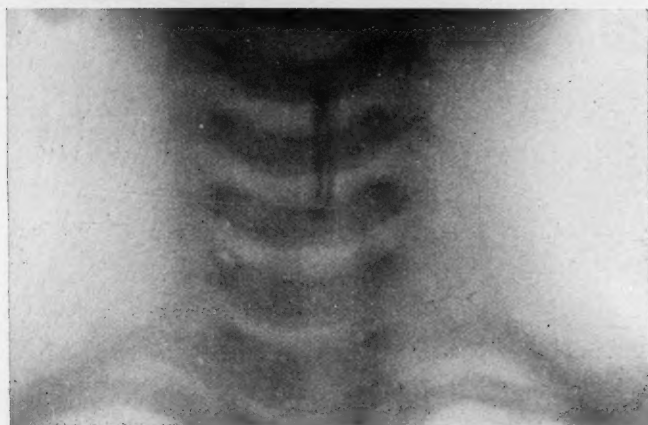
*Family History.* Negative; mother, father, one brother and one sister living and well.

*Present History.* Six months ago, while playing with two little girls, the patient had three or four pins in her hand. They were all playing in the house when the little girl suddenly came running to her mother very cyanotic and pointed to her neck and at inter-

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\*Reported at the Eye, Ear, Nose and Throat Section, Academy of Medicine of Northern New Jersey.

vals said, "Pin was in throat." Had coughing spell and at each coughing attack became cyanotic, also vomited off and on for one-half hour. The mother of the child took her to their family physician, who examined her and said nothing was in throat; he ordered



an X-ray picture taken and the report was "nothing in throat;" all this was done the same day the child aspirated the pin.

Later the patient became hoarse, beginning to lose her voice, had choking spell and cyanotic. Her family physician again called, and because of difficulty in breathing made a diagnosis of laryngeal diphtheria and gave antitoxin.

The patient has continued the same to present day and came to the hospital upon the advice of the family physician to have the child's tonsils removed. August 24, 1920, I first saw the child, hearing the typical laryngeal breathing and asthmatoïd wheeze audible. The mother then informed me that the child had been breathing that way ever since she had diphtheria six months ago.

I did a direct laryngoscopy, expecting to see a stenosis of larynx, instead saw foreign body between cords.

I then informed the mother that the child had a foreign body in larynx and not until this time had the mother volunteered the above information.

X-ray was taken. Objective findings in nose and pharynx, negative. Chest, abdomen, and extremities, negative. Had no difficulty in eating or drinking.

X-ray by Dr. Baker, the foreign body being an open safety pin, the keeper of pin just on level with vocal cords, the point was pointed upwards and anterior and to the right of median line. The point being embedded in subglottic tissue of the larynx.

At the hospital without anesthesia, through a child's Jackson laryngoscope, the supra-glottic structures all edematous and between cords the keeper of the pin was seized with alligator forceps, entire pin was pushed down for dis-impaction and the point rotated to the median line for removal; result was extraction and cure, time of operation being twenty seconds, child leaving the hospital the next day; convalescent period uneventful.

671 Broad Street.

## PERITONSILLAR ABSCESS AND ITS RADICAL TREATMENT.\*

DR. ISAAC M. HELLER, New York City.

Quinsy is one of our oldest affections and has been generally regarded as very painful but not at all serious. Occasionally one meets with severe hemorrhage due to sloughing and a number of fatal results have been reported. The writer met with two such cases of severe hemorrhage, one of which ruptured spontaneously but fortunately without fatality.

The tonsil is an ovoid lymph gland lying in a triangular prism fossa and which leaves spaces at the angles and which are filled in with loose connective tissue. It is into these spaces, especially the upper, that the pus ruptures from the infected tonsil. Since under great pressure, it must follow the paths of least resistance, outward and backward are the strong constrictors of the pharynx while above lies the velum palati, inward is the tough tonsil itself so that the only available direction is downward between tonsil and muscles. This forms a sort of cylinder of pus with its base at the tongue level and its top in the supra-tonsillar fossa. This accounts for the failure of these cases to recover after a single incision in the usual location in the soft palate. The pus must drain uphill a violation of a cardinal surgical principle. Where drainage is incomplete, healing may leave an encysted mass behind, as Griffin states, which may break out afresh under proper stimuli, similar to an abscessed appendix or pus tube.

Treatment hitherto has been of the "hit or miss" fashion; the best in our profession differ widely as to how, when and where to operate, but all operations are of the stabbing type. The writer maintains that the proper treatment for a quinsy is the dissection out of the tonsil en masse. One must have on hand a good electric headlight, suction apparatus and tongue depressor with mouth gag for administering ether. All cases are given ether by the drip method without gas, which these patients do not seem to tolerate at all well.

The affected side is attacked first. A sharp-pointed knife is introduced in plica between tonsil and anterior pillar at base of tongue. (No matter how much swelling and edema are present, this space

\*Abstract of paper read at the Section of Laryngology, New York Academy of Medicine, October 27, 1920.

can always be found.) A blunt-pointed but sharp-bladed dissector is then carried up between tonsil and anterior pillar to the dome of the former. Anterior pillar is now dissected free so that almost all of the anterior surface of tonsil is exposed. With suction tube ready (writer uses tube the caliber of a lead pencil) dissection is carried behind tonsil where pus will always be found. Nothing is then done until pus is completely aspirated out of abscess cavity. Dissection then is completed as it is in the ordinary, uncomplicated tonsillectomy and base snared off. At first only the offending tonsil was removed; later both were taken out, as the other side usually has been infected at some previous time; after-treatment is the same as in ordinary tonsillectomy.

Forty-eight cases have been treated in this manner with two deaths. The first cannot be laid to the operation.

Female, aged 38, seen on August 21, 1917, having had a right-sided peritonsillar abscess five weeks before and opened in the usual manner and healed. For three days there was pain in the left side with swelling over tonsil and on left side of neck. Radical operation was advised and refused. The next morning, after spending a wretched night and unable to swallow anything, she came to the hospital and begged for relief.

The operation of dissection presented nothing unusual except the right or older side bled more freely and showed a one-half thimble full of caseous pus deep down behind the tonsil. That night temperature rose to  $104^{\circ}$ , came down to  $102^{\circ}$  in three days and ranged to  $103.5^{\circ}$ . First thought was sepsis, although local symptoms were not unusually severe. Blood culture was negative. Blood count showed 220,000 white blood cells per cu. mm. and 81 per cent lymphocytes. Careful examination showed small lymph nodes in axilla and groin, and close questioning brought out the history of gradual loss of flesh and strength for some six months. It was a case of lymphatic leuchemia complicated by quinsy, and in spite of appropriate treatment she died on the fifteenth day, but the throat was entirely healed and gave no trouble after one week. A close investigation of her previous history and general condition would have saved the operator much chagrin and annoyance, although the final outcome would have been the same regardless of any treatment.

Second case was that of a boy  $3\frac{1}{2}$  years old, the youngest case of peritonsillar abscess of which the writer has any knowledge. Seen at noon, March 29, 1919, after one week's illness, which had been diagnosed as simple tonsillitis. For four days he had eaten

nothing but small quantities of milk. Left tonsil enormously swollen beyond median line. Operation advised and refused; that evening he was taken to a well-known specialist who attempted to incise the abscess but without success. He spent the night in his mother's arms dozing off at times but choked and turned blue on attempting to lie down. The next morning at eight the father brought him to the hospital and asked for relief. At 12:30 p. m. a radical operation was done exposing a deep-seated pocket of pus behind tonsil, a situation difficult to reach by the ordinary method. Operation lasted ten minutes and he was fully conscious in one-half hour. During afternoon he took ice cream and milk and felt quite well under the circumstances. At 9 p. m. he was resting nicely, at 11 p. m. suddenly he became cyanosed and breathing ceased.

The house surgeon did a tracheotomy and instituted artificial respiration. Shortly after, the writer saw him and found the patient unconscious with shallow breathing and rapid pulse, color quite good, throat void of blood and pus, while collateral edema of pillars and uvula present before operation had disappeared. In spite of stimulation he died at 2 a. m., 13½ hours after operation. No autopsy was allowed but tracheotomy wound was enlarged sufficiently to remove thymus which weighed 24½ grams. This was probably a case of status lymphaticus in a child much depressed by a week's illness and semi-starvation. Carter reports a similar case after ordinary tonsillectomy three hours after operation. By this method one need not wait for an abscesses to ripen and point. He may operate as soon as the diagnosis is made even as early as thirty-six to forty-eight hours. This has the advantage not only of saving of time to the patient but avoids several days of pain and loss of strength from semi-starvation and sleeplessness. It is surgical in that it removes the cause and that one operates with all steps of the procedure under full view and not stabbing about more or less aimlessly.

355 East 149th Street.



## VACCINES IN THE TREATMENT OF ASTHMA.

DR. G. H. SHERMAN, Detroit, Mich.

In the June 26, 1915, number of the *Journal A. M. A.* Babcock furnished a very valuable paper showing the causative relation of asthma to an infected focus in some part of the body, usually the respiratory tract, and that vaccine treatment is the most logical procedure. He clings to autogenous vaccines, evidently because stock preparations have not been given a fair trial in these cases, on the ground that they are not sufficiently scientific. He even points out that in many cases it is difficult to carry out this method of treatment, because the focus of infection may be obscure. From this, we would infer that he considers the finding of the focal infection primarily necessary so organisms may be procured for the purpose of making an autogenous vaccine, and that vaccine treatment is not instituted until an autogenous vaccine can be prepared from organisms found in some infected focus. He states that this procedure is surrounded with possible failure because the organism thus found may have not caused relationship to the disease, in which case repeated bacterial examinations are recommended for the purpose of making autogenous vaccine until, if possible, a vaccine made from an organism that will give the desired results is found.

This is the attitude of autogenous vaccine advocated generally and reflects the desire of an exact scientific procedure in doing things. This in itself is very commendable, but it so happens that many things in life are of such a nature that what appear scientific, upon closer examination, is found deficient in many details. It is only by utilizing all the available factors which bear on the attainment of a certain object that constitutes the treatment of the matter in hand scientifically.

In treating a case of asthma, the object is to cure the case, permanently, if possible, in the shortest space of time, and any procedure which will accomplish this is scientific.

A large majority of asthmatics suffer with bronchitis, and are subject to taking colds. The organisms that are responsible for bronchitis and colds are well known. It is also known that sinus

infections and other focal infections are caused by the same organisms; and, with a few exceptions, and in the absence of an influenza epidemic, a comparatively small group of organisms is responsible for the persistence of these troubles, including the pneumococcus, streptococcus, Freidlander bacillus, micrococcus catarrhalis and staphylococcus. Mixed infections by these organisms is common, and from experience we know that just as good immunizing responses are obtained to infections by any one of these organisms by inoculating a vaccine containing all of them as if only the vaccine corresponding to the infecting organism had been employed. Where single organism infections exist, mixed infections practically always develop if immunization to the other organisms has not taken place, and by using a mixed vaccine such prophylactic immunity in addition to a therapeutic immunity to the germ or germs causing the infection will be established. After taking into account all these facts can the giving of a mixed vaccine be considered unscientific? Is it unscientific to employ measures that will prevent infections which are liable to take place while the existing infection is being cured? Here the crucial test comes in applying the remedy to attain the object in view, and from what experience teaches, in the treatment of asthma with a mixed vaccine, we certainly have reason to believe that this method is entirely practical. In our personal experience we have repeatedly cured most obstinate cases that had gone the round of other methods without obtaining relief. This experience has been verified by many other physicians. The underlying principle in treating asthma with vaccine is to permanently eliminate the focus of infection. Vaccine therapy offers the best means to this end, and carefully prepared stock vaccines give, with rare exceptions, as good, if not better results than autogenous preparations.

3334 East Jefferson Avenue.

## THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OTOTOLOGY.

November 12, 1920.

**Double Mastoiditis. Perisinus Abscess. Prolonged Post-Operative Temperature. Unusual Blood Count. Recovery Without Further Operation. Dr. J. L. Maybaum.**

Sophie A., age 13 years, was admitted to the Manhattan Eye, Ear and Throat Hospital, April 24, 1919, service of Dr. T. P. Berens, with an acute mastoiditis involving the left ear. Past history as to general and aural disease negative. There was a history of influenza two months previously followed by pain in the right ear; ear drum ruptured spontaneously, moderate purulent discharge which ceased after three weeks. Four weeks before admission to the hospital the patient began to complain of pain in the left ear, followed two days later by a profuse purulent discharge. She had had considerable pain in the region of the left mastoid for a period of one week before entering the hospital.

*Examination on Admission:* Fairly well nourished, anemic individual, she appeared to be quite ill. Temperature 102°, pulse 84, respiration 18.

*Left Ear:* Profuse discharge from the middle ear—under tension. Small insufficient perforation in left inferior quadrant. Posterior-superior wall decidedly sagging. Hearing markedly impaired. Periosteal thickening, extreme tenderness, left mastoid.

*Right Ear:* Slight muco-purulent discharge, perforation in posterior-inferior quadrant; drum injected and thickened; landmarks absent excepting short process of the malleus. Hearing function, whisper 10 feet. Resolving right middle ear.

I did a simple mastoidectomy (left) the same evening and found an extensively involved mastoid. Free pus under pressure and pale gelatinous granulations throughout. Sigmoid sinus covered with pus and granulations-perisinus abscess.

On the ninth day following the operation on the left mastoid, patient began to complain of a recurrence of pain in the right ear. Temperature rose in a few hours from 100° to 104°, pulse 90, respirations 22. Right drum bulging and showing small amount of pulsating pus from the perforation in the posterior-inferior quadrant.

Although the temperature dropped gradually after the paracentesis, the aural discharge was quite profuse and the pain in right ear continued during the next 48 hours. Slight mastoid tenderness and periosteal thickening. X-ray examination May 2, disclosed pus and granulations with beginning bone absorption. The operative findings on the right side differed little from that found at the operation on left mastoid, except that the perisinus abscess here was smaller in extent and the sinus in the region half inch posterior to the knee was covered with granulations. The patient's convalescence from then on was uneventful and on May 25 she left the hospital, returning to the clinic for her dressings. The subsequent course was rather interesting.

On May 29 she was readmitted to the hospital. She had been feeling well until the evening before, when she became feverish and complained of severe frontal headache. Temperature 105°, pulse 140, respirations 24. Dr. Stowell reported general examination as to heart, lungs and abdomen negative. Reflexes normal. Both mastoid wounds very satisfactory showing healthy granulations and slight amount of muco-purulent discharge. During the next two days the temperature fluctuated between 102 and 104°, pulse 124 to 138, respirations 24, six days later her readmission to the hospital, the temperature had gradually returned to normal. Two general examinations during this period reported nega-

tive. Laboratory reports will be detailed later. On June 7, 8, 11 and 24 the patient had a distinct sharp rise of temperature from 99 to 104, 104.6, 105, and 106, respectively, followed in each instance by a rapid decline to normal, the third time to subnormal, within twelve hours. A chill of five minutes' duration, the only one throughout her illness, preceded the second rise of temperature.

There was an interval of 24 hours between the first and second and third days between the second and third elevations of temperature, followed during the next two weeks by a temperature ranging between 98 and 101°. At the end of two weeks of practically normal temperature, during which the patient's general condition was excellent, there occurred a third rise of temperature within a few hours from 100 to 106 and again a rapid decline to normal. From then on the temperature remained within normal limits and patient left the hospital July 5, refusing to remain for further observation. At the height of each temperature rise the pulse relative to the temperature was slow, ranging between 100 and 108. Except for general malaise during each elevation of temperature, the patient continued to show a steady improvement in health. She returned to the clinic during the next two weeks for her mastoid dressings, at the end of which time she was discharged fully restored to health.

As to the laboratory findings:

Three blood cultures were taken by Dr. Dwyer, showing no growth after 56 hours, incubation.

Seven blood counts were made with the following results:

May 1, 1919, Leucocytes 18,600, Large Mononuclear Lymphocytes 10%, Small Mononuclear 2%, Lymphocytes 2%, Polynuclear 88%.

May 2, 1919, Leucocytes 18,200, L. M. L. 10%, S. M. L. 28% Polys 62%.

May 21, 1919, Leucocytes 10,200, L. M. L. 7%, S. M. L. 25% Polys 68%.

June 1, 1919, Leucocytes 5,600, L. M. L. 40%, S. M. L. 43% Polys 17%.

June 7, 1919, Leucocytes 5,000, L. M. L. 42%, S. M. L. 29%, Polys 28%.

June 11, 1919, Leucocytes 7,200, L. M. L. 34%, S. M. L. 8%, Polys 58%.

July 3, 1919, Leucocytes 8,400, L. M. L. 28%, S. M. L. 4%, Polys 68%.

These blood counts were confirmed by independent examinations of two experienced laboratory workers.

The first three blood counts were taken at various times before the first sharp rise of temperature. The second three were taken during the period of temperature rises. The final count was taken ten days after the last temperature elevation. Wassermann, negative. Urine examination, negative. Culture from each mastoid showed streptococcus pyogenes.

Eye, grounds examined and found negative.

A presumptive diagnosis may be made in this case of a sinus thrombosis, the symptoms, considering the various facts in the case, being accounted for by the presence of an aseptic clot in either lateral sinus. The exclusion of any other possible factor responsible for the rises of temperature, together with the general well being of the patient, three negative blood culture findings and the absence of leucocytosis would tend to substantiate this assumption.

A possible tubercular process, syphilis, malaria, were kept in mind because of the repeated findings of a relative lymphocytosis, but physical examinations failed to disclose anything abnormal.

In children a lymphocytosis not infrequently takes the place of a polymyeloecytosis during infective processes.

Among the factors influencing me in adopting a conservative attitude in this case as to further surgical interference were:

1. The continued general well being of the patient throughout in spite of her rises of temperature. She could be kept in bed only with the greatest difficulty.
2. The long interval between the second and third rises of temperature and the absence of any further rise.
3. Three negative blood cultures.
4. Absence of leucocytosis following double

mastoidectomy, although typical "sinus thrombosis" temperature rises occurred.

## DISCUSSION.

DR. McCULLAGH said that without doubt in certain cases of sinus thrombosis spontaneous recovery takes place. Dr. Maybaum's case reminded him of one seen several years ago. He could not recall the exact blood picture, but the patient was a woman who four or five days after operation developed a typical sinus thrombosis temperature chart, the blood picture corroborating the diagnosis. Unlike Dr. Maybaum's case, the patient became progressively worse, with repeated chills. The rise of temperature came on with a very marked degree of regularity. The patient refused further operative intervention, and after running this temperature for two or three weeks insisted on going home. She went home in a bad general condition. It was not known whether she was treated at home or not, but the nurses kept track of her and eventually she made a perfect recovery.

There seemed to be no question but that there was a thrombosis in the sinus which was taken care of by the natural forces of resistance.

*Cerebellar Tumor:* Case presented for diagnosis. Doctor A. S. Wilson.

*Case Record:* Matilda Tulverson, age 37, single; nativity, Sweden; housemaid; admitted October 11, 1920.

*Summary:* Diminished hearing both ears, right more affected than left, low tones raised, high tones lowered, bone conduction diminished, Rinne negative. Spontaneous falling, unmodified by changes in position of head, right semi-circular canals give remarkably diminished reaction to caloric and turning tests.

*Complaints:* Falls to right, noises in head, deafness, general weakness and headaches.

*Family History:* Negative. *Personal history:* Periods regular, painful, five to six days' duration.

*Previous History:* Constipation and minor stomach trouble (nervous breakdown 10 years ago). Malaria four years ago. Duration, one year. Took quinine during this period and dates noises in the head from this time. Tonsilitis three years ago. Sore throat two years ago, accompanied by deafness, which was suddenly relieved by blowing the nose (inflammation in the head). Patient dates deafness from this period, first in right ear, then in left. Headaches for the past two or three years.

Present illness dates from January, 1920. Patient fainted on the street, was removed to home and had sore throat, cough, prostration, fever pains in the body for two or three days. This was followed by extreme weakness, vertigo, headache. Was in bed for two months, unable to walk, falling in all directions upon attempting to walk. Gradual improvement up to August, 1920, since which time she falls to right only.

*Nose:* Septum slightly deviated.

*Throat:* Tonsils enlarged and fibrous. No debris could be expressed.

*Ears:* No history of discharge. Accumeter, R. 1 in. L. not heard; whisper, R. not heard, L. heard tones only; voice, R. 6 in., L. 2 ft.; low tone, R. 1024, L. 256; high tone, R. 20, L. 2.0; Schwabach, R. diminished, L. diminished; Rinne, R. negative, L. negative; Weber, R. equal.

*General:* Pupils equal-react to light and accommodation, reflexes slightly exaggerated. No corneal anesthesia. No hypermetria. No adia dokokinesis. No asynergy. No tremor. No disturbances of writing. No atony or hypertony. No bradycardia. Wassermann negative; spinal fluid, negative; X-ray of skull, negative.

Patient ran temperature running as high as 103° on one day from time of admission. After three weeks, temperature dropped to normal, following a course of calomel.

*Tests of Semi-Circular Canals:* Spontaneous. Vertigo, none; nystagmus, none; past pointing, none; falling, to right, falls to right regularly after every second step, these two steps being normal in character. Turning head to right: No change in direction of falling. Turning head to left: No change in direction of falling. Romberg: Sways and

falls to right. Pelvic girdle test: Balances poorly, but this would appear to be due to muscular awkwardness.

| TURNING              |                                   |                                    |
|----------------------|-----------------------------------|------------------------------------|
| HEAD UPRIGHT         | To RIGHT                          | To LEFT                            |
| Vertigo              | Slight                            | Slight                             |
| Nystagmus:           | 10 sec. horizontal to left        | 8 sec. horizontal to right         |
| Past Pointing: R. H. | To right once                     | To left both                       |
| L. H.                | Touched                           | To left                            |
| CALORIC              |                                   |                                    |
| HEAD UPRIGHT         | RIGHT                             | LEFT                               |
| Vertigo              | Slight                            | Marked                             |
| Nystagmus:           | Slight rotary to left<br>1 1/4 m. | Rotary to right 45 sec.<br>marked. |
| Past Pointing: R. H. | Touched                           | Touched                            |
| L. H.                |                                   |                                    |
| Falling:             | Not changed                       | To left                            |
| HEAD BACK            |                                   |                                    |
| Vertigo:             | Slight                            | Marked                             |
| Nystagmus:           | A very slight twitching noticed.  | To right, horizontal 30 seconds.   |
| Past Pointing: R. H. | Touched                           | Touched                            |
| L. H.                |                                   |                                    |
| Falling:             | Not changed                       | To left                            |

The above results were not invariable. The earlier caloric tests requiring a longer period of irritation of ears to produce reaction.

#### DISCUSSION.

DR. FRIESNER said that he had had an opportunity of examining this patient a few days since, and outside of the falling and the loss of the reaction movement or falling in the opposite direction, ..... spontaneous falling, there was no evidence of cerebellar tumor that he could see. It had occurred to him that the uniformity and regularity of the falling strongly suggested a neurotic element. That there should be some vertigo could be readily understood, for it could be recalled that the functional tests showed a coincident and co-equal diminution in vertigo and nystagmus on one side and a slight diminution from the other as well. There might be a peripheral lesion, probably a toxic one, due to the attack of malaria during the previous year, when she took large doses of quinine. She had some disturbances in hearing, principally of the conductive type. While of course that would not coincide precisely with the findings of the vestibular apparatus, there was no question but that with coincident and co-equal (diminution) the lesion must be peripheral. There was no cerebello pontile angle tumor and it seemed very doubtful whether there was any cerebellar tumor.

DR. KERRISON said there could be no doubt as to hysterical factor in this case. For example, the patient, unsupported, tended always to fall to the right, and in trying to walk she regularly took two steps and then swayed to the right. But if in walking one allowed her to take one's arm and at the same time engaged her attention in conversation, the tendency to fall was not in evidence.

DR. KERRISON said that he had himself tried her caloric reactions with the following anomalous results: Irrigation of left ear with water at 70° Fahrenheit induced nystagmus to right in 45 seconds; during this nystagmus, the subjective disturbance (vertigo) seemed very slight, and there was no loss of pointing accuracy in either arm; i. e., the normal reactions were absent. Irrigation of the right ear with cold water was



continued one minute and thirty seconds before nystagmus to left was produced; during this nystagmus the right hand deviated to the right, but the left pointed accurately, i. e., did not show the normal reaction to the right. These pointing reactions, or absence of pointing reactions, are exceedingly unusual and difficult to explain. The case is one in which no definite diagnosis can at present be made, and which calls for further careful observation.

Dr. WILSON said that the brain abscess of which Dr. Kerrison had spoken, had also been spoken of by the patient as an inflammation in the head and she said that something broke when she blew her nose. The assumption was that that was when she blew into the Eustachian tube. The history submitted was the result of ten or twelve different statements which had to be analyzed and brought into some sort of coherence.

The first irrigation in the right ear showed more constantly prolonged irrigation to get the result than later; at first, only in two or three minutes, now in a minute or a minute and 45 seconds we get a reaction, though not a marked one.

#### A Case of Sinus Thrombosis. Dr. Isadore Friesner.

The patient, a young man, came to the hospital in October, with a discharging ear which had troubled him for many years, a constant foul discharge. Ten days before admission, the discharge ceased and he began to have pain in the head which became gradually worse. On admission, he had a fluctuating tumor over the mastoid, and there was a polyp in the external auditory canal. He had vertigo on sudden movement of the head, and a slight nystagmus to the right. The Weber was referred to the left. He had a temperature of 100°. The discharge from the external canal was brownish and foul. The diagnosis was simple; he evidently had an infected cholesteatoma with a subperiosteal abscess.

Dr. Worcester, with my assistance, did a radical mastoid. We found foul pus and a broken down cholesteatoma. The floor of the middle ear was eroded, and between us we managed to injure the bulb. The bleeding was readily controlled but had not ceased at the time the operation was completed. Packing with an iodoform plug readily controlled the bleeding, but the injury to the bulb did not seal over as small injuries usually do. At the time the operation was completed the removal of the plug was followed by quite a little bleeding. In addition to the cholesteatoma we found a large perisinus abscess. The sinus was almost horizontal. There was a post-operative rise of temperature to 104.6, and a gradual descent through four days to normal. On the sixth day following the operation, he had a chill and a rise of temperature to 105°. A blood count was taken and showed 15,000 white cells and 80 per cent polys. Blood culture was negative. Then the temperature dropped and remained normal for three days. At the end of the third day, there was a slight chill and rise of temperature to 103°, followed by another chill and another slight rise. A blood culture made at this time was again negative.

It may be wondered why we did not interfere. There were two reasons. First, the man's general condition was very good. During all this time his pulse was never higher than 90. Even with the rise of temperature to 105° his pulse was charted at 80 and his general condition remained good. I have seen other injuries of the sinus with two or three chills and then nothing more. The other reason was that I believed the man must have his lesion in the bulb itself, and I hoped that with a degree of waiting we might have at the time of operation complete occlusion of the bulb so that we could follow the sinus down to the horizontal part and open the bulb.

Twelve days after the original operation, the man again had a chill, and on the following day I made up my mind that he was thinner, had lost more weight than was natural for him even under the circum-

stances, lying in bed, eating well, without pain, and with a good appetite; he had lost more weight than he should. During that time his temperature was comparatively normal. Furthermore, there was a slight icteroid tint to the sclera, he looked a little yellow.

The following day he had another rise of temperature, and we then explored the sinus, but found nothing in the lateral sinus—a rather curious finding when you remember that he had had his infection thirteen days before. A few years ago I saw in a neighboring town a child who had had an injury to the bulb from a myringotomy, operated on for sepsis. At the time the sinus was exposed there was a clot beyond the knee. In six days, not only the bulb became thrombosed but the sigmoid sinus also to the knee. In our operation we could see the intima, we could see the cerebellar dura. We got normal bleeding from the bulb and normal bleeding from the torcular end. The sinus was blocked off in that way, a rather unsurgical proceeding, and yet it was the only thing we could do; we bottled up the infection as it were, leaving the inferior petrosals and the condyloids free in the cavity. The vein was excised.

He again had two days of practically normal temperature with only one rise to 103° on the second day. On the third day after the jugular operation he had a chill with a rise of temperature to 107°; this came down in a few hours to 104°, and he had a second chill with a rise to 105.5°. The next day his temperature dropped to 100°. This was followed by a chill and a rise to 103°. On the morning of this day we found on dressing the wound an indurated area in the upper part of the neck, corresponding in a general way to the position of the vein which had been left in. Realizing that the man's infection was confined to the bulb, I made up my mind that I would open the bulb. When Dr. Worcester dressed him on the day he had the last chill, I told him that this indurated area should be laid wide open with a pair of forceps and should be packed. When the upper part of the wound was thus opened a considerable amount of foul-smelling grumous fluid issued. I had seen that once before, not so very long ago, in August, with practically the same findings. I believe the upper part of the vein sloughed through, draining the bulb. The temperature came down to normal and has been so for twelve days. The man is up and about the wards, looks well, and says he feels perfectly well.

#### DISCUSSION.

DR. MAYBAUM said that he had had an opportunity of following this case almost from the start, and expressed his admiration at the conservative attitude which Dr. Friesner had observed throughout the case. Although the patient had quite a number of chills and rises of temperature, Dr. Friesner did not rush in hastily. This course not only tended to bring about clotting in the bulb, but at the same time, if the patient had had any other underlying condition it would have had time to come to the surface. Everything else being equal, this should be the attitude and the surgical procedure in the most cases of sinus thrombosis. It would be interesting to know whether, in Dr. Friesner's experience, he had found a slow pulse to be of any prognostic importance in cases of sinus thrombosis. Another thing he had observed during the operation was that meddlesome surgery was avoided. As there was considerable hemorrhage from the torcular end and free bleeding from the jugular end after incising the sigmoid sinus, the inner wall was examined and as the sinus wall did not appear to be particularly diseased, no attempt was made to excise it. The adoption of a conservative course in such cases which might result in a clot forming in the bulb was the proper procedure, since if a bulb operation should become necessary it would, at the same time be more feasible.

DR. FRIESNER, replying to Dr. Maybaum's inquiry about slow pulse, said that he had seen this in three other instances. The course of the

lateral sinus thrombosis was the same as these, not severe—in individuals with intervals of normal temperature followed by chill and rise, but all three came to operation, and in two of them which he saw there was a definite clot in the sinus.

Answering Dr. Hurd's question: Of course the question of surgery of the bulb has not yet had the last word said, but in cases where there is a sinus phlebitis, where the sinus is blocked off, where the bulb is blocked off from the circulation by a clot and where there is a continuation of positive findings of the blood, and where a septic temperature continues, or where the patient is manifestly running down, it is indicated to follow down the sinus to the bulb. Dr. Friesner said that he has made up his mind, when he operates on a sinus thrombosis where no bleeding occurs from the bulbar end, provided the patient is in sufficiently good shape to permit it, that he would follow it down to the bulb. He would rather spend a little more time on the sinus following it to the bulb and spend less time in the neck, simply tying the vein and cutting it. In a considerable number of phlebitis cases the tying of the vein and cutting it between ligatures is sufficient. The worst that you get if things do not go smooth is a localized abscess in the neck.

**Cavernous Sinus Thrombosis of Otitic Origin.** Dr. J. L. Maybaum.

Frank L., 12 years of age, was seen by me at the Manhattan Eye, Ear and Throat Hospital August 15th, 1918, service of Dr. T. B. Berens. The history which he gave was as follows: Previous aural history negative. The patient's parents did not recall that the boy had any of the infectious diseases of childhood; was always in good health until two years ago. At that time he was struck by a brick just above the left ear. He was immediately taken to the Presbyterian Hospital where he was operated on for fracture of the skull. After remaining at the hospital for three weeks, he returned home practically restored to health. From then until four weeks ago he had been in excellent health. While bathing at the seashore, he developed severe pain in the left ear, frontal headache followed two days later by a profuse aural discharge. He was treated by his physician for a few days and then referred to a general hospital. His ear symptoms subsided somewhat but he began to have attacks of continuous nausea and vomiting; was treated for a few days for a gastro-intestinal condition. At the end of five days he was brought to the Manhattan Hospital, complaining on admission, of considerable pain in the left ear and mastoid, headache. Two chilly attacks during the last thirty-six hours; fever, nausea and vomiting.

On admission on the afternoon of August 15, the patient appeared extremely ill. His temperature was 103°, pulse 96, respirations 20. The temperature rose from 100 to 105° in a few hours, pulse 110, respirations 24.

Examination of left ear: A large perforation in postero-superior quadrant from which a foul-smelling discharge was escaping. Marked sagging of the superior bony canal wall. There was some edema over the right mastoid and exquisite tenderness especially over the emissary Hearing of the right ear very much impaired. No spontaneous nystagmus. Both labyrinths reacted within a minute to caloric stimulation. Pupils react sluggishly. Some rigidity of the neck present. Kernig absent. Knee and abdominal normal.

Blood count: August 15 showed: Leucocytes, 18,500; Polynuclears, 84%.

Nothing abnormal was found on thorough physical examination of the heart, lungs and abdomen.

I did a lumbar puncture before operating and withdrew 10 c.c. of cloudy spinal fluid under increased pressure.

On operation that evening, I found an extensively involved mastoid large perisinus abscess. The sigmoid sinus from the knee down had a dirty yellow-grayish appearance and pus could be seen oozing from an area of the sinus about one-fourth of an inch in diameter near the knee.

The sinus exposure was carried back for a distance of more than half way toward the torcular end before normal appearing sinus wall was reached. This part of the sinus was covered with granulations. The usual degree of exposure of the sigmoid sinus to the lower limit was carried out. There were no granulation covering this part of the sinus from the perforated sloughed area to the lower end of the exposure. The sinus wall, however, had a grayish, thickened, lusterless appearance. An extradural abscess was found in the region of the posterior fossa near the knee. Exposure of dura of middle fossa over tegmen antri disclosed nothing abnormal.

A jugular resection was done. The vein was collapsed almost to the clavicular end and had very much the appearance found on exposing the sigmoid sinus.

On opening the sinus a partly disintegrated clot was found in sigmoid sinus, only slight bleeding from the jugular end. There was a firmer clot in horizontal part of the sinus upon removal of which free bleeding occurred.

The patient reacted fairly well following the operation. On visiting him the next morning considerable edema of the left eyelid was present. Other evidences of a cavernous sinus thrombosis soon followed. Exophthalmos became marked. The ocular conjunctiva showed a pronounced chemosis; pupil of left eye dilated and fixed. Because of the dulled sensorium of the patient and the rapidly increasing edema of the eyelid, the question of ocular mobility could not be determined. The symptoms which were present previous to operation continued unabated, the evidences of meningeal involvement becoming more pronounced. Daily fluctuations of temperature between 110 and 124. The last three days the temperature continued high, the remissions being less marked. On the third day following the operation the right eye became similarly involved. The condition grew progressively worse, the patient lapsing into coma, dying the 7th day from his admission to the hospital. No autopsy permitted.

Laboratory findings: Culture from the mastoid—*streptococcus mucosus*. Blood culture negative. Cerebro-spinal fluid: turbid; sugar absent; trace of albumen, marked trace of lactic acid, contained abundant mononuclear and polynuclear leucocytes. Bacteriological examination negative.

The findings in the cerebro-spinal fluid together with the symptoms on admission would indicate that the patient had on entering the hospital, in addition to a jugular thrombophlebitis, at least a circumscribed purulent meningitis.

This case is reported not only because of the comparative rarity of the form of otitic sinus disease involving the cavernous sinus, but because of the lesson since then derived from this experience. The prognosis of these cases is recognized to be quite hopeless because of the inaccessibility of the cavernous sinus to such surgical procedure as are applicable to the lateral sinus. Wherever, in a case of lateral sinus thrombosis the bleeding from the jugular end is either diminished or absent or where clinical evidences continue, following a lateral sinus operation, of jugular bulb thrombosis, an endeavor should be made to drain the bulb.

During the past few years Dr. Whiting has repeatedly demonstrated this to be feasible. I believe he has not, as yet, published his work along these lines. The bulb can be entered from behind, without danger of injury to the facial nerve, by removing the posterior wall of the bony channel in which the sigmoid sinus takes its course. I have done this upon the cadaver quite a number of times in the past few months. Dr. Friesner further enlarges the approach to the bulb by removing the jugular process of the occiput.

## DISCUSSION.

Dr. MAYBAUM, replying to Dr. Hurd's inquiry about the possible nasal origin of the case, said that that was ruled out very thoroughly. The picture throughout pointed to a cavernous sinus thrombosis of otitic origin.

Replying to the question by Dr. Herzig as to why the eye on the side of the lesion cleared up and the other continued uninvolved to the end, Dr. Maybaum said that this had been observed in other cases of cavernous sinus thrombosis, but no explanation had been offered for its occurrence. The sensory symptoms to which Dr. Herzig referred could not be observed, for the patient from the very beginning was quite apathetic and could not answer any questions.

**Acute Double Mastoiditis. Aseptic Meningitis. Double Operation. Recovery.** Dr. Harold Hays.

*(To be published in a subsequent issue of THE LARYNGSCOPE.)*

## DISCUSSION.

Dr. GOTTLIEB inquired whether in Dr. Hays's case there was any involvement of the eye muscles. The pain in the supra-orbital region suggested Gradenigo's syndrome.

Dr. McCULLAGH said that Dr. Hays' case reminded him of a case in which he had done an exploratory operation for cerebellar abscess and failed to find it. The patient's convalescence went on uneventfully for a week when she developed all the symptoms of a violent meningitis. The diagnosis seemed so evident that the patient was not disturbed in any way, and a very gloomy prognosis was given to the family; but inside of a week the patient was out of the hospital and is now perfectly well. Several years ago he had reported a case of cerebrospinal meningitis that recovered spontaneously. So one should bear in mind the fact that even definite and frank meningitis may be followed by recovery.

Dr. HAYS said that he was glad Dr. Gottlieb had brought up the question about the examination of the eyes. During the past year, he had had four cases develop supra-orbital pain after operation, but with one exception the eye grounds were negative and there were no symptoms of Gradenigo's syndrome. Dr. Whiting saw some of these cases, and said that in one week he had seen six similar cases, and rather felt that the symptoms were due to involvement of the zygoma beyond the cells usually reached.

This child had no doubt an infection of the part that went beyond the cells. Whether the symptoms which she developed after the second operation were due to that or not, he did not know, but he thought not. She probably had a definite meningeal focus; that she recovered could only be explained by saying that in some way it ruptured into the mastoid wound. In one other case that Dr. Friesner saw with him, the patient, a boy, had an excruciating pain over the eye which came on in. He did very well for a while, but finally it was necessary to re-operate. At the second operation, he did not like the way things looked; necrosis was found at the angle of the semi-circular canals, besides extreme necrosis of the zygoma. The boy came to the office regularly for dressings while the wound was healing. One morning he suddenly developed convulsions with a temperature of 104°. That afternoon he was unconscious, and it was decided to explore the wound. With Dr. Friesner's assistance the brain was explored thoroughly but nothing was found. At the end of 48 hours the boy died.

Dr. Hays said that the only conclusion he could draw from these cases was that, for some reason, the streptococcus haemolyticus was particularly virulent last year. Most of the men he knew made the same observation.



**Death After Mastoidectomy with Status Lymphaticus.** Dr. Lester Mead Hubby.

M. P., age eleven months, admitted to my service at the Harlem Hospital February 28, 1920.

Family history negative. Healthy in appearance. Birth at full term with a normal delivery. Breast fed.

Three months previous to admission had an attack of acute purulent otitis on the left side. This soon cleared out reappeared on February 23. Four days later a swelling arose behind the left ear. I saw him for the first time on February 29. There was a moderate swelling behind the left ear. The left membrane tympani was dry but bulging. I did a myringotomy letting out some pus.

Diagnosis. Acute purulent otitis, acute mastoiditis with subperiosteal abscess. Rectal temperature 100.4° Fahrenheit. Pulse 120. Respiration 26.

The following day a simple mastoidectomy was done by Dr. Jacob Braun. The pus from the subperiosteal abscess was found to come from an opening in the bone over the mastoid antrum. Mastoid was then curetted.

The internal plate of the tegmen antri was found eroded and the dura of the middle fossa exposed, but fairly normal. The wound was closed with metal sutures except at the lowest portion where an iodoform gauze drain was inserted to the antrum. He was returned to the ward and appeared to be very well during the rest of the afternoon and evening. But the temperature began to rise during the night and reached 106.6° Fahrenheit by four a. m. Pulse 140. Respiration 44. He became pale and pulseless and, notwithstanding stimulation, died at 9 a. m.

He had no convulsion or other noticeable symptom except the increasing circulatory failure and high temperature.

**Autopsy Notes of Dr. L'Esperance:** M. P., age eleven months, died March 2, 1920. Autopsy March 2, 1920.

The body of a well-developed, well-nourished male child. The skin is smooth and fair; the hips are narrow and the limbs are beautifully formed. The configuration of the typical "angel child." Eyes, ears, nose and mouth appear normal. On the left side of the head, in the region of the mastoid, there is a recent operative incision, which appears clean and healing.

On opening the skull the brain appears normally developed. There is considerable congestion of the cerebral vessels on the right side and a corresponding lack of congestion on the left side. Probably a postmortem condition. The meninges show no gross pathological change. The longitudinal sinus contains fluid blood; the lateral sinus on the right side contains a small postmortem clot. There is no evidence of thrombosis of any of the cerebral vessels.

The chest: The configuration of the thorax is rounded and the mediastinum anteriorly appears completely filled with the thymus gland. This gland extends to the tip of the pericardium and laterally the lobes reach the lung, entirely covering the anterior surface of the pericardium. Weight 20 gms.

The heart and pericardium are negative. The foramen ovale is closed and the valves are normal.

The lungs are well aerated, except in the posterior portions where there is some hypostatic congestion. The bronchi contain a small amount of mucus. The mucosa is negative.

The liver is large and studded with pale yellowish white foci, pin-head to pea size. These areas have indefinite outlines and suggest lymphoid tissue.

The spleen is of normal size, very firm in consistence with prominent malpighian bodies.

The intestines are negative. The mesenteric lymph nodes are large, firm, hyperplastic, many reaching the size of hazel nuts. These nodes transform the mesentery into a nodular mass of tissue, each node re-



maining discreet. On cross section they show focal areas resembling focal necroses.

The kidneys: Capsule strips easily and the surface is smooth. On cross section the markings are obscured and the pelvis is dilated. The ureters are also dilated to the size of a small goose quill.

The adrenals are extremely small, measuring  $1 \times 1\frac{1}{2}$  in. The whole organ appears shrunken: the cortex so thin it appears as a mere line, the medulla and cortex measuring 1 cm. The picture is that of the typical tissue paper cortex.

Anatomical diagnosis: Status lymphaticus; enlarged thymus; atrophy of adrenals; hyperplasia of mesenteric lymph nodes; congestion of cerebral vessels; focal areas of lymphoid tissues in liver; hyperplastic splenitis; parenchymatous nephritis; congenital hydronephrosis.

*Comment.* The unusual features to be noted are: First, that death occurred twelve hours after the operation when the elements of strain and shock had entirely disappeared, the child appearing that evening very slightly if at all weakened by the operation. Second, how to explain the rapidly rising temperature just prior to death.

A small iodoform gauze drain would hardly be sufficient to produce such a result.

Was some new complication beginning such as meningitis, intracranial venous sinus thrombosis or infection elsewhere?

The gross pathology at the autopsy revealed nothing of that kind. The hyperpyrexia and possibly toxemia however caused, was too heavy a strain on the defective organism and death ensued.

This is a not unusual fate of those suffering from status lymphaticus. Such patients are more liable to have the virulent forms of most infectious diseases and to succumb early.

#### **A Substitute for Rubber Tissue As a Drain.** Dr. James Woods Babcock.

Having been dissatisfied with the quality of rubber tissue now procurable, I have been searching for a better material for its field in drainage. Recently, the characteristics of a transparent paper used to cover candy boxes lead to its trial and it seems superior to rubber tissue for all purposes.

It can be sterilized by boiling in water or in a steam sterilizer without injury. Dr. W. C. Johnson, of the Department of Pathology of Columbia University, experimented with it and finds it insoluble in acetone, alcohol and ether. It, however, is softened by boiling in an alkali. Dr. C. G. Coakly has used it for a drain and finds it perfectly satisfactory. Serum will, however, adhere to it somewhat.

It is waterproof and comes colorless, blue, violet and red. The colors are, however, not strictly fast, but do not stain a wound. It is tough, but on being folded sharply will crack a little so that it tears easily in the folds. Dusting it with talcum powder makes its surface even smoother and it keeps indefinitely. It burns about as freely as ordinary paper.

The paper is now marketed under the name of Fenestra Paper, and is imported from France by Birn & Wachenheim of 121 West 17th St., New York City. Its exact composition is unknown to me, but it is doubtless a nitro-cellulose, although its importers thought it was an alcohol derivative.

This is no new thing, as Dr. Donald Gordon has used it since 1914 but lost track of its source as it was not made for several years. He gave a very laudatory account of its use in his hands. Several other men have used it including Dr. R. T. Atkins who reports that a surgeon from Iowa gave him some during the past summer. Dr. Auchincloss mentions it as Flexoid Paper in *Brewer's Surgery*. No account of its use has been published to my knowledge and I deemed it worthy of mention on account of its wide range of usefulness.

**Tuberculosis of the Middle Ear in Children.** Dr. Med. Frithjof Leergaard, Kristiania, Norway.

(To be published in a subsequent issue of THE LARYNGOSCOPE.)

## DISCUSSION.

Dr. DWYER said that this was a very important paper on a very important subject. Several points had impressed him especially. In 1911-12 Dr. Gerard H. Cox and himself published a paper on this subject. There is a very much superior method of trying out the subject. Petroff's method. By this on the same day you can demonstrate whether or not the tubercle bacillus is present. That work has been carried on all these recent years, so that we don't have to wait five or six weeks for guineapig inoculation.

He expressed his astonishment at the large number of adults that gave a negative von Pirquet reaction. The von Pirquet is positive in a very large proportion of cases, showing they had it at one time or another. If a patient has or has had a positive tuberculosis condition, they will give a positive von Pirquet practically for life.

He said he would not place any great stress on the von Pirquet in children over five years. In children up to five or seven years of age the bovine type was found; in adults the human type.

He then told of a strong perfectly healthy man who developed a tuberculosis after a pneumonia—developing t. b. in one ear, with a typical profuse watery discharge—and the human bacillus was demonstrated.

The differentiation is simple. The bovine will kill animals quicker, it is far more pathognomonic for animals than the human type. With adults, the results are just the opposite—they give the human type almost without exception, whereas the children give the bovine type. In several instances facial paralysis was seen.

Dr. Dwyer said he did not think we have to operate very extensively.

With the Petroff method we can demonstrate the organism. Dr. Leegaard was to be congratulated on the paper he had presented.

Dr. Dwyer said he understood that in Norway they were using Koch's old tuberculin. Here we use either the emulsion or Koch's T. R.

Dr. HURD said that he had seen quite a number of these cases at times, and almost always succeeded in making the diagnosis. He then asked whether Dr. Leegaard made a complete radical operation, like a mastoid. He himself feels hesitant about making them too clean.

He then cited the case of a boy with a double mastoid, the mastoid cavity being broken down and filled with pus, a rather typical type of granulation. In operating he went through the mastoid and down to the labyrinth in the petrous portion. He curetted, but did not try to strike bone everywhere, but kept off the nerve and left the wound open. The child's father was a blacksmith, living in the western part of New York and was a rather clever man, so he was shown how to use bismuth paste in the ear. In six months he brought the child back, perfectly well, simply by living in the open air and being treated with the bismuth paste.

Dr. LEEGAARD, closing the discussion, explained that it was difficult for him to reply properly to the points brought up, since he found it very difficult to understand spoken English. He had purposely made the paper very short and it was impossible in the limited time at his disposal to explain all he would like to say. The investigations had been reported fully in his book on the subject.

Many of these patients come to operation without tuberculide. By operating on a guineapig he could say that it was a tuberculous case. Even this benign form in children yields often only with operation. When the child is not well and yield seems to go on all right, a secondary mastoid operation is done, a secondary radical operation is done. It is, of course, a point of very great importance if one can get healing even in the course of a rather long time. It is better to do only one operation and keep the hearing than to do a radical and get the healing in a shorter time.

Of course the mastoid processes are made as clean as possible, not only in non-tuberculous cases.

Replying to Dr. Dwyer's question as to whether Koch's old or new tuberculin is used in Norway: Dr. Leegaard said that in Norway they

use very little tuberculin, there is almost no treatment with tuberculin. He had made his experiments because he was interested to test this local treatment. He had never seen or heard anything of local treatment, and wished to try it, and then he had Koch's old tuberculin which was used in a large amount. He could not say what tuberculin is used by the tuberculosis physicians in Norway. They use emulsions and other preparations of various kinds.

## SECTION ON RHINOLOGY AND LARYNGOLOGY.

November 24, 1920.

**Bone and Cartilage Transplantation for Saddle-Back Nose (Specific).**

**Prop. Operation.** Dr. William Wesley Carter.

Miss A. D., 17 years of age.

**Family History:** Father, mother and three sisters living and well. There is absolutely no history of specific disease in any of the family and all the members are unusually strong and healthy.

Patient was perfectly healthy up to the time she was 11 years of age, and has never, so far as she knows, come in intimate contact in any way with anyone infected with lues. As a child, however, she was accustomed to play with a number of dirty little children. She has no recollection of a sore on any part of her body or of an eruption.

When she was 11 years old, suddenly, without pain, her right leg swelled up, turned black and ulcerated. The lower end of the fibula became necrotic and was removed. At the same time her face and nose became swollen; there was a discharge of blood, pus and necrotic tissue from the nose. The bridge of the nose fell in and this organ developed a saddle-back deformity. Her hair dropped out.

Blood examination at this time showed positive Wassermann.

The treatment consisted of three doses of salvarsan, followed by ten injections of salicylate of mercury. Prot iodide of mercury was given internally. All symptoms disappeared and the patient has remained strong and healthy. Four Wassermann tests have been made at intervals, the last two months ago; all of these are negative. I regard the case as one of cured syphilis.

On October 27, I transplanted a piece of conjoined bone and cartilage from the eighth rib into the nose in the manner I have previously described and as there was no support for the nasal tip I made a strut of cartilage and imbedded it in the anterior edge of the septum; one end of this strut resting on the nasal process of the superior maxilla and the other in contact with the under side of the dorsal transplant. This supported the tip perfectly and as you see, the result is very good. Healing was perfect and the patient left the hospital ten days after the operation.

## DISCUSSION.

DR. HAYS expressed his appreciation of the work done by Dr. Carter in bone transplantation, and then cited a specific case operated upon along similar lines a few years ago. Of course specific cases are very poor ones for transplant work, but this one was rather unusual. A piece of rib was excised and put into the nose according to the Carter method. A few days later there was a slight bogginess around the eyebrows and the patient was running a temperature of 100°. A probe was inserted and brought out a thick discharge of tenacious pus. In the course of a few days it healed up, but later there was a protrusion of the bone from the left nostril. This was cut off, and a week later the patient left the hospital. Then a sinus developed over the bone on the right side and it grew larger and larger. Such sinuses indicate infection of dead transplant, and after leaving the piece in situ as long as was felt to be safe it was removed with rongeur forceps. After that it healed up and enough tissue formed to hold the nose in shape, and the patient was not seen for about a year, when she called at the office. Her nose was then

in excellent shape and she wore a pair of glasses. She had made a perfect recovery, with a dead transplant, part of which had to be removed.

Certain types of these cases do better by intra-nasal operations, such as many men are doing today, particularly Dr. Tieck of this city. Dr. Hays said that he had seen several of these cases showing an excellent result, and a point of great importance was that there was no scar whatsoever on the outside of the nose.

Dr. HELLER said he noted that Dr. Carter had used a piece of the rib in this case, and then cited his own experience with a case operated upon last spring. Because of the immense amount of deformity, he felt that he would have to use a heavier piece of bone than a rib, so took a piece from the shin, but he would never do that again. The tibia had just healed now, after eight months. The nose gave no trouble whatever and there was no infection in the leg. The wound was sewed up and healed by primary union, but a blood clot formed from the marrow and there was quite a hematoma. It was kept closed as long as was deemed safe, and then it had to be cleaned out and healed by second intention. At no time, however, was there any pus in the wound.

Dr. CARTER said he presumed that Dr. Hays had not had opportunity to examine this case, for the work was all done from the inside of the nose and there was no scar on the outside. He has not done an external operation for a good many years, but all cases are operated from the inside of the nose. He had heard of the operation mentioned by Dr. Hays, and understood that it was some method involving the transplantation of the turbinated bone. He had seen some cases that had been operated upon by that method, but the ones he saw were not satisfactory. Furthermore, the turbinate has an essential function and should not be removed for it is *not* regenerated after removal. Should there be an infection continuing for more than three days, he makes it a rule to take out the transplant. In his operation work, however, he has had very little trouble of this kind, on this subject.

Referring to Dr. Heller's remarks about the use of the tibia, Dr. Carter said he had never had much faith in the tibia used as a transplant in these cases. It is very compact bone and it is difficult for it to receive proper nourishment when it is used as a graft in the nose. As a rule, it will remain there as a foreign body. He himself never uses it.

Dr. Carter expressed regret that none of the men had spoken of the possibility of curing syphilis. This was an unusual case and shows a good result. The deformity was undoubtedly of specific origin. The bone was well united, and bony union was already occurring between the transplant and the frontal bone.

**Double Frontal Sinus Operation.** Dr. Edward L. Pratt.

**The Newer Motion Picture Photography of the Nose and Ear; Exhibition of Pictures.** Dr. Harold Hays.

As you all know, moving pictures of operations are not new. Numerous pictures have been shown which have visualized the operation fairly well. I have been thinking for some time whether it would be possible to demonstrate operations within the nose, and showing the various procedures employed in the treatment of nasal, throat, and aural conditions. Fortunately, after thinking this over for quite a time, I became aware of the fact that the Bray studios had been making some educational pictures along anatomical lines showing "How we Hear," "How we See," etc., and I tried to get them to co-operate with me. After explaining to them my ideas, we were able to work out an experimental film. I say this, to account for various discrepancies that may be observed. The pictures can be taken in two ways and described in two ways. One, by actual photography of the parts on a well preserved specimen; and the second by animated anatomical drawings.

As I go on with this work I believe we will have more valuable aid in teaching by the use of the animated drawings than by the actual specimens. The first film that I will show you was made simply as an experiment, and illustrates the passing of the Eustachian catheter. After that,

I will show the Bray educational film, "How we Hear." This was not meant for the profession but for the laity, but it will give you an excellent idea of the work they are doing. Their animated anatomical drawing of the "Human Voice" is very remarkable. I shall have in a few weeks these pictures showing the actual articulation of every sound, and the actual motion in the larynx while the speaking is taking place. It will show the value of the scientific experts who are willing to do these things.

I should be very glad of any suggestions as to how this method can be improved, for the Bray Studios are anxious to obtain all the assistance possible in improving this work.

#### DISCUSSION.

DR. CARTER expressed his appreciation of Dr. Hays' efforts in bringing before the Section this very interesting demonstration of the method of hearing and of the various operations which can be performed upon the nose.

DR. LAW said that he had employed motion pictures for teaching X-ray technique for the past year and found it an excellent medium of instruction, saving about one-fourth of the time. What the eye sees the brain retains, thus making a lecture with motion pictures much more instructive and comprehensive. The motion picture has been used by the surgeons at the Manhattan Eye, Ear and Throat Hospital to illustrate some of their cases, before, during, and after an operation. It is far superior to still pictures to illustrate the cosmetic results of operations on the head.

DR. LEDERMAN said that pictures were shown some three or four years ago taken by Drs. Wyeth, Chetwood and Bodine, demonstrating the operation of amputation of the hip, nephrotomy and hernia. They were taken for teaching purposes. The steps of the operation were shown very clearly. One of the later improvements of the motion picture, the ability to reduce the speed of the roll, is a valuable addition to the technique, for the operation can be shown slowly and the various points brought out more clearly. These pictures were not colored, and as the operation proceeded the flow of the blood could be seen quite distinctly, as a dark fluid, covering the wound area.

DR. McCULLAGH recalled a motion picture demonstration by Dr. Phillips, of the mastoid operation made by a company that makes a specialty of pictures of surgical work. As Dr. Hays had said, moving pictures of intra-nasal work on living subjects cannot be made—at least, at present.

**Lung Abscess, Following Tonsillectomy: Bronchoscopic and X-Ray Findings.** Dr. Irving W. Voorhees.

*(To be published in a subsequent issue of THE LARYNGOSCOPE.)*

#### DISCUSSION.

DR. PRATT said that a patient, an adult of 45, was operated upon at Bellevue Hospital by Dr. Coakley last July under local cocaine anesthesia. The mucous membrane surrounding the tonsil was infiltrated with half per cent cocaine in the usual manner and the tonsil was enucleated by scissors and snare. He was present at the time, and not more than two drops of blood appeared from either tonsil at the time of the operation. The patient remained in the hospital for four days, and on the third day complained of a severe sticking pain in the throat and chest. The members of the medical staff reported negative findings in the chest, and thought it was intercostal neuralgia. The patient returned home, but still had these sticking pains and cough. Shortly afterward a diagnosis of lung abscess was made on the physical signs alone. This was confirmed by radiography and the patient had a rather stormy time for several weeks. The lung abscess was followed by pneumonia, and that by empyema. Various measures were suggested in the way of treatment, bronchoscopy, etc., but nothing was done except carefully to observe the patient. He was seen a few days since, and is now ready to leave town for the purpose of recuperation; he has practically regained his health, without operation.

Dr. Coakley had asked that this case be reported, for in previous dis-



cussions on the subject of lung abscess following tonsillectomy various points had been brought up as to the etiology in such cases. Here was a case done under local anesthesia, with the patient's pharyngeal reflexes all present, and hardly enough blood to stain a sponge, yet three days later he developed a lung abscess. The only explanation that could be offered was that in this instance it might be due to an infected thrombosis in the lung.

DR. CARTER said that he regarded the fact that an abscess of the lung followed the operation for adenoids and tonsils in Dr. Voorhees' case as sufficient evidence that either infected blood or adenoid detritus had been drawn into the lung during inspiration, and there was no doubt in his mind that this was the origin of the abscess.

He failed to see how it could be reasonably attributed to thrombosis and thought that the assumption was far-fetched.

Dr. Carter attributed the accident to a deficiency either in the construction or application of the apparatus used for suction during the operation. He had never seen a properly constructed apparatus for removing the blood and detritus from the throat. All those coming from the instrument makers are made of metal, they are inflexible and do not reach the recesses of the pharynx, they are apt to bruise the tissues; furthermore, the openings in them are so small that they become clogged by small pieces of adenoid tissue and even tonsillar concretions. The apparatus should have a large tube and a considerable negative pressure should be used.

Dr. Carter said that he did not believe in pressure-ether narcosis, and in adenoid and tonsil cases he considered it dangerous.

In his service in Gouverneur Hospital, he has averaged for several years 1,250 adenoid and tonsil cases per annum, yet, so far as he knows, there has not been a single case of abscess of the lung. Had such an accident occurred it surely would have been known, for all adenoid and tonsil cases are required to report for examination one month after the operation. The suction apparatus in Gouverneur Hospital was installed under Dr. Carter's direction, and is connected with the steam heating system. It is so constructed that a vacuum is produced by having steam come in contact with cold water. The apparatus is connected with a large bottle by means of a short rubber tube; from a second opening in the bottle a long tube is run to the operating table; in the end of this tube is fitted a piece of glass tubing, upon which in turn is fitted a piece of rubber tubing about six inches long, one end of which is scalloped. The number of these mouth-pieces, sterilized and kept in a basin, corresponds to the number of patients to be operated upon—a separate tube being used for each case. The rubber being soft, the throat is not injured, and the scalloped end favors the removal of all the blood and detritus, so that the field is kept perfectly clean during the entire operation. This, Dr. Carter believes is the essential precaution, and if it is observed, lung abscesses following tonsillectomy will be avoided.

DR. BABCOCK cited a case seen by Dr. W. W. Herrick last summer, in which pressure had been made by Dr. E. L. Pratt to see if there was any secretion in the crypts of the tonsils. After the patient returned home, he had a temperature of 102°, and showed some patches in the lungs that cleared up in a few days. It was treated by Dr. W. W. Herrick, and his opinion was that the man had an infarct of the lung, probably due to manipulation of the tonsils. It is hard to make out the mechanism, for such a brief handling would hardly produce a septic clot and loosen it at the same time; yet if such a thrombus existed it could easily be liberated by that much trauma. That case seemed to furnish evidence against all cases being due to insufflation. They may be due to septic infarcts and occur in other conditions where there is no possibility of insufflation. He recalled one case that followed the removal of an appendix. Insufflation can hardly explain all these cases of lung abscess.



DR. NORTON L. WILSON cited the case of a child of four, who on the fourth day after operation set up an abscess of the lung. In his opinion, both of the previous speakers were right, these conditions do occur from infarcts and from insufflation. Dr. Voorhees had spoken of care in using the curette. Dr. Wilson said that he himself always carries the tongue depressor back to the pharynx so the curette strikes the tongue depressor, and in that way catches these tabs. So far as the suction is concerned, he uses a rubber tubing over the suction apparatus, with a large opening, but had never had the serrations on the end which Dr. Carter referred to. He felt convinced, however, that some of these cases, as the one reported by Dr. Babcock, occur through the blood stream rather than through insufflation.

DR. LYNNAH said that he had not known that an enlarged thymus associated with status lymphaticus could be responsible for a bronchoscopic death until he had heard Dr. Hubby's report. He had personally bronchoscoped eleven cases suffering from tracheal stenosis due to an enlarged thymus gland, and so far all of the patients were alive. Of course no anesthesia was used. In this case Dr. Lynnah said that he was sorry that Dr. Hubby had gone out of his way and blamed the poor thymus and status collapse for the cause when there were so many other complications which would easily account for demise. As a rule when we do not know the cause of death we usually attribute it to status lymphaticus, but such was not the condition here. The very fact that the patient had pneumothorax develop after the attempted removal of the tack would have been sufficient cause in itself when the bronchus was ruptured near the hilus of the lung. Dr. Imperatori had demonstrated on animals that it was an easy matter to rupture the bronchus and cause sudden death, and this with the other complications was the probable cause of death in this patient.

The introduction of the bronchoscope is very important. The head should be slightly flexed to get a good exposure of the larynx, and then slightly extended after the introduction of the bronchoscopic tube through the laryngeal speculum before the laryngeal speculum is rotated for its removal.

Any attempt to rotate the laryngeal speculum for removal while the bronchoscope is firmly engaged in the speculum in the semi-flexed position may cause disaster, especially if the tube has been introduced too far down into the trachea. Rotating the laryngeal speculum in this position will also rotate the bronchoscope, and may bore a hole into the carina and cause instant death.

Dr. Lynnah said he wished to confirm all that Dr. Imperatori had said about local anesthesia, and he was glad that Dr. Forbes had brought up that point. It is quite remarkable how little patients complain after a bronchoscopic examination.

Dr. Lynnah said that he had been interested in abscess of the lung following tonsillectomy ever since Dr. Norris Manges read his paper on this subject. There was no question of the truth of what Drs. Voorhees, Babcock and Pratt had said about embolic abscesses and inspiration abscesses, but there was still another consideration to be taken into account, and that was the condition of the lungs at the time of operation whether under local or general anesthesia. In going into the histories of the cases of lung abscess following tonsillectomy at the Lenox Hill Hospital, many of them gave a history of having coughed up pus prior to the time of removal of the tonsils. There were three cases of post-influenza bronchiectasis that had also been attributed to tonsillectomy. Again, in general surgical operations other than tonsillectomy, many of the abscesses may be due to inspiration of vomitus when the patient is coming out of ether. He had seen a case recently with Dr. Willy Meyer where a man on whom he had operated for gall stones inspired vomitus containing food as he had eaten some breakfast before admission to the hospital. This patient developed an acute lung abscess three days following the operation. Many of the abscesses may occur this way, for vomitus is one of the most extremely irritating substances when

inhaled into the lung. He thought from what he knew of embolic abscesses that they most frequently followed long standing pyaemic conditions, such as sinus thrombosis and the like, and this was why the general condition of the patient should be taken into careful consideration before the operation. He was, however, convinced that inspiration of infected secretions and vomitus were responsible for the great majority of the cases, whether the operation was under local or general anesthesia.

Dr. HELLER remarked that Dr. Voorhees' patient did not show any lung symptoms until 10 days after the operation. The majority of the cases he knew of occurred three or four days after operation. Dr. Voorhees' cases also had chronic sinusitis. Might it not have been possible that the abscess resulted from the pus in the nose as well as from the tonsil. It seemed hardly possible that ten days should have elapsed before the development of the abscess alone.

Dr. ALFRED BRAUN said that practically all the cases of lung abscess which were admitted to Mount Sinai had developed in 10 or 12 days after the operation. He had been much interested in Dr. Pratt's report, for that was the first case of lung abscess which had come to his attention following a tonsil operation done under local anesthesia. A number of laryngologists have given the danger of lung abscess as one of the reasons in favor of local anaesthesia operations as against general anesthesia operations.

The reason for lung abscess, given by Dr. Pratt, namely a pulmonary embolism, is a very plausible one. We see lung-abscesses quite frequently from thrombosis in the lateral sinus, and there is no reason why it should not follow thrombosis of some of the veins in the tonsillar region.

Dr. UNGER said that most of the lung abscess cases had been reported as occurring in adults and not in children. He said also that it would be interesting to know whether any observations had been made as to the relation between a fibrous tonsil and the development of a lung abscess. If a lung abscess is due to a thrombus from a tonsil, it is more apt to develop when the blood vessel walls are kept from collapsing by the fibrous connective tissue about a condition existing in fibrous tonsils. The breaking up of a thrombus is more liable to happen during tonsillectomy under ether than under local anesthesia, because in the former case the pharyngeal reflexes are abolished and the pharyngeal muscles are relaxed; so that the muscles exert no constrictor action about the cut and thrombosed blood vessels, whereas the opposite conditions exist in the latter case.

Dr. McCULLAGH said he had heard Dr. Howard Lillenthal who has had a large experience with cases of lung abscess, read a paper in which he claimed that if a lung abscess developed ten to twelve days after a tonsil operation it was proof positive that the abscess was due to the inspiration of tonsillar detritus. That was a point that might be very useful in diagnosis. Dr. Voorhees' case of lung abscess did develop ten days after the operation, therefore it seemed likely that it was due to inspiration of a plug from the crypt. Those that develop within a shorter period of time are probably due to a thrombus.

Only this spring he had had a very unpleasant few days owing to the complaint of a patient whose tonsils had been removed under general anesthesia, four or five days previously, that she had fetid expectoration. It did not smell fetid to him, and remembering the point about the ten-day period of incubation, he had tried to console himself that she was not developing a lung abscess. Repeated chest examinations by various consultants failed to show anything, although she complained of the fetid expectoration for at least two months, after which time he left on his vacation. He had heard indirectly, within the past month, that the condition cleared up.

Dr. VOORHEES, in closing the discussion, remarked that what Dr. Lynah had said was very important: we should know something about the condition of the lungs in order to protect ourselves. We do so many

tonsil operations and most of them turn out so well that we do not always take sufficient pains to examine the general condition of the patient, previous to operation, and that is where the general man has reason to criticise the nose and throat man a great deal. No one who has had a patient with a lung abscess should criticise anyone else, but the point is to search for the causes and prevent another such occurrence. This was the first lung abscess he had encountered in his experience.

Dr. Heller's suggestion that something from the right antrum may have gotten into the lung might be correct, but it seemed more likely that some cheesy tonsillar material got down into the trachea. In the future, however, he would be more careful to see that the crypts were thoroughly cleaned out before operation by the Sluder method. In the snare operation there was not so much evagination of the tonsil, as by the Sluder method, and less likelihood of expressing crypt detritus.

Dr. PRATT said he had been wondering whether Dr. Voorhees had considered the possibility of the trouble coming from the removal of the post nasal plug—that some of that material might have gotten down.

Dr. VOORHEES replied that the patient was back in her room and fairly out from the influence of the anesthesia when the plug was removed, although it was possible that that might have been the cause.

**Cavernous Sinus Thrombosis Secondary to Peritonsillar Abscess.** Dr. John D. Kernan.

The patient was an Italian, 18 years old. He was admitted to the Presbyterian Hospital October 15, 1920, with the following history. Sixteen days before he had had a peritonsillar abscess opened in an outpatient clinic after it had run a course of four days. Eight days before admission he had again been compelled by pain and difficulty in swallowing to seek relief which was given by a second opening. Six days before admission the original symptoms recurred, and in addition appeared swelling of the right eye, headaches, diarrhoea, anorexia, thirst, noises in his ears, and deafness. Three days before his coming to the hospital developed a cough and began to raise a blood tinged sputum. At this time also he became delirious.

**Physical Examination:** A very toxic looking young Italian boy with a swollen right eye and icteric tinge to skin and sclerae. There was tenderness along the course of the left sigmoid sinus, and swelling of the neck below the left ear. No eye palsies. The bases of both lungs were congested and there was a spot of consolidation external to the apex of the heart. A blowing systolic murmur could be heard over apex and base of heart. The left leg was spastic; temperature 104°.

**Laboratory Findings:** Leukocytes 15500, 86% polynuclear. Blood culture sterile. Blood Wassermann negative. Spinal fluid showed staphylococcus aureus.

**Course:** The temperature was 108° the morning after admission, coma developed, and death ensued 20 hours after admission to the hospital.

**Autopsy:** The organs in general showed the congestion we would expect to find in any severe septicaemia. There were several small abscesses in the lungs and a beginning endocarditis. There was swelling in the throat about the left tonsil and a sinus leading into an abscess cavity in the left peritonsillar region. To the outer side of the superior constrictor, in the pharyngomaxillary fossa, was an abscess containing about an ounce of foul pus. The internal jugular vein was thrombosed. This thrombus extended upward into the lateral sinus a short distance beyond the knee. Both petrosal sinuses were involved, both cavernous sinuses, and the clots were found to extend into the ophthalmic veins. All these clots were partially broken down into foul material like pus. There was an abscess of the left temporosphenoidal lobe of the cerebrum.

The lesson to be drawn from this case may be briefly summarized:

1. The dangerous character of the often lightly regarded peritonsillar

abscess. 2. The importance of early drainage, and persistent drainage till healing is accomplished. 3. Every external swelling should be regarded with suspicion, and prompt drainage of the pharyngomaxillary fessa should be made if the symptoms persist in spite of seemingly adequate internal incisions. 4. In making external drainage the condition of the internal jugular vein should be investigated.

#### DISCUSSION.

DR. BRAUN said that it was a very interesting case and had some unusual features, and inquired whether at the autopsy the mastoids were examined.

DR. KERNAN replied in the affirmative and said that they were found to be normal.

DR. BRAUN said that it was very unusual to get such a sequence from a peritonsillar abscess, but it was fairly common as a result of mastoiditis. The other unusual points were that with a thrombus in both cavernous sinuses there were symptoms in one eye only.

The most surprising thing in the whole report was the fact that the cardinal symptoms of cavernous sinus thrombosis, namely proptosis of the eyes and paralysis of the ocular muscles were absent. He had never seen a case of cavernous sinus thrombosis without these symptoms.

DR. HELLER said it was a most interesting case. As some of the members might recall, he had at the last meeting of the Section read a paper on the radical treatment of peritonsillar abscess and had quoted a number of fatal cases that had occurred in various parts of the country, first quoting Newcomb's series. The case just reported by Dr. Kernan was another instance of what is ordinarily regarded as a simple thing to be treated by the ordinary practitioner. This man had pus in his throat, went to an institution, the abscess was opened at its most superior point, closed again, and was again opened at its superior point. Pus will not drain uphill any more than water. If one will dissect out a tonsil for quinsy he will understand this better; seven-eighths of the pus lies below the level of the superior point; of course sometimes if the opening is big enough or the pus does not lie so low, it empties itself out, but where seven-eighths of the pus is below the opening and you have the elastic muscular tissue around it that tends to close the opening, you don't get the drainage. Dr. Heller said he felt confident that had Dr. Kernan's patient had his tonsils removed the first time he went to the Manhattan Eye, Ear, and Throat Hospital the case would not have followed the course it did. You cannot have pus under pressure without paying for it. If he remembered correctly it was Kennerson of Buffalo who reported a case where the pus burrowed down under the fascia causing edema of the glottis and the patient expired. The laryngologists ought to pay more attention to this apparently simple matter of quinsy.

DR. KERNAN, closing the discussion, repeated that the mastoids were opened in this case and were found to be normal. Dr. Braun had somewhat misunderstood him. There was a proptosis of the right eye.

In regard to the removal of the tonsils during the active stage of the peritonsillar abscess, he was not sure that he had any right to quote another's case at all, but felt that he ought to mention it, for the subject of the removal of the tonsils during a peritonsillar abscess was not a closed matter. There was a case at the Manhattan Hospital recently where the tonsils had been removed during the active stage. The patient came in about a week after the operation, having bled continuously since, with an enormous slough on the operated side of the throat, and died soon after from hemorrhage into the throat. It looked as though the sloughing had gone on just the same in spite of the operation, or because of it. It is by no means certain that it is a safe procedure to operate in that way in the presence of pus. It was very much like breaking up the adhesions about an appendix abscess. The matter of operating on a peritonsillar abscess is a very serious question.

## SECTION ON OTOTOLOGY.

*December 10, 1920.***Simple Mastoiditis Without Tympanic Involvement. Dr. J. Braun.****Double Mastoid Operation. Acute Thyro-Renal Exhaustion... Dr. James G. Callison.**

Mortimer B., about nine months old, was admitted to the Manhattan Eye, Ear, Nose and Throat Hospital, late in May, 1910, having for two months suffered from sore throat and recurrent furunculosis of his auditory canal, going from one physician to another for treatment. Examination revealed a retro-pharyngeal abscess, which was incised, and he was kept in the hospital for irrigations.

On June 17, 1918, he was again treated in the office, this time for a recurrence of the furuncle in the auditory canal.

In May, 1919, he underwent a tonsil and adenoid operation in a Boston Hospital; but the adenoids were incompletely removed and he remained a mouth breather.

On January 31, 1920, at which time he was two and a half years old, he was again brought to the writer, suffering with a running nose and a right otitis media. The drum was incised under ethyl chloride.

On February 3, he developed a left otitis media, and that drum was incised. He also underwent myringotomies nine days later, on February 12 and 16.

On February 19, the remainder of the adenoids was removed, with a post-nasal polyp.

From January 31 on, he was seen every other day, the ears being cleansed, dried, and inspected. On every attempt to dry the ears he fought violently, thrashing about with all his might, although the manipulations were as gently done as possible. As a result of all this treatment, he became thoroughly afraid of me. These many infections show a patient below par in so far as his resistance is concerned, and as a result one with ample reason to be afraid of a doctor.

In spite of all efforts, both ears went on to a mastoid infection, and a double mastoid operation was performed on February 27, the patient being in the hospital thirteen days—the strange surroundings, the absence from home, the suffering and the nurses all contributing their quota in adding to his fright. When I entered his room in the hospital, especially at night, his pupils dilated, the palpebral fissure widened, his face flushed about the cheeks and malar bones while he became deadly pale about the mouth, and he screamed continuously: "No more, doctor! No more, doctor!" a picture of abject extreme fright.

The wound was slow in healing, and about the eleventh day it became evident that it was not doing well. From that time on the child went rapidly to pieces, so far as the condition of the wound and his mentality was concerned. On the fifteenth day after operation the edges of the wound were everted and angry looking, and it was breaking down along the entire length of the original incision, and the external auditory canal was pouring out pus. Smears from the wound showed a short chain streptococcus, the same infection that had been present before operation. The physical and mental condition of the patient were on a par with the state of the wound. His muscles were weak, he had difficulty in balancing himself, even more than his weakness would account for. It was impossible to elicit any facial expression from him. He cried, but without facial or vocal expression of pain. When placed on the floor after completing a dressing, he planted his feet far apart, seemed to take no interest in anything, and with a vacant stare and the head falling forward would allow the thick mucous saliva to drool from his mouth. At home he remained continuously in bed or on his



mother's lap, moaned "Ah, baby!" or screamed, "No more, doctor!" and took no interest in anything.

About this time, on the theory that the patient was suffering from thyroid exhaustion, he was given syrup of the iodide of iron medication, to supply some immediately available iodine to the thyroid gland, and a few days later was sent to Dr. M. G. Pease for examination with a suggestion as to the diagnosis of acute thyroid exhaustion. Agreeing as to the probable cause of the breakdown, Dr. Pease placed the boy on onetenth grain of dried thyroid gland substance three times a day.

Two days after the thyroid medication, 19 days after operation both the wound and the mentality of the child began to show slight improvement, and the ichthyol and silver nitrate dressings were discontinued, the wound being simply dressed with five per cent iodoform gauze.

There was a slow, continued improvement after this until March 28, when on account of my illness the child was sent to Dr. Imperatori for dressings. In making this change, the thyroid gland substance was inadvertently discontinued, and the improvement in the patient's condition also stopped. From March 28 to April 16, Dr. Imperatori made every possible effort to induce healing, but with practically a total failure. He was compelled to believe that he was dealing with a badly performed operation in which all the necrotic bone had not been removed from the mastoid. When returned to me on April 18, the patient had rather more discharge from the operative wounds and from the auditory canals than when I had last seen him and the granulations were more unhealthy. At this time the operative wounds opened directly into the attic, there was still bone on both sides uncovered with granulations, the clip abscesses on the right had scabbed over, but did not look healthy, and on the left side they were still open ulcers.

I immediately began to attempt to destroy the unhealthy granulations and to induce healthy granulations over the exposed bone, using silver nitrate and tincture of iodine, etc., but with only partial success. I also prescribed the syrup of the iodide of iron as a tonic, as this had been discontinued. This treatment was kept up until April 30, with slow improvement in the wounds, mainly that they were cleaner. During this time the mother directed my attention to the presence of Sargent's adrenal white line, in this instance produced by the baby rubbing his face with his hand. On April 30, I prescribed Harrower's adreno-spermin compound, containing thyroid substance gr. 1/12; adrenal substance gr. 1/4; spermin gr. 1, as an adjuvant to the adrenal substance and brain substance for its organic lecithin, one capsule four times a day. At this time both ears were discharging pus from the auditory canal and the operative wounds; small operative wounds reaching the attic on both sides; bare bone at the bottom of both operative wounds just posterior to the attic where the antra had been opened. About three-fourths of an inch above the operative wound on the left side was an open ulcer three-eighths of an inch in diameter, where the original incision had broken down. On the right side there had been a similar breaking down and ulceration; this had scabbed over, but the healing had stopped there and the scab had not been cast.

In addition to the ear trouble the child had when first seen in January a running nose. This had persisted and had gradually become worse during all the time he was under treatment, at times assuming the form of a membranous rhinitis. It was at all times so severe and resistant to treatment as to suggest an indolent ethmoiditis. This condition had not perceptibly improved when he was placed on the thyro-adrenal combination.

On May 2, the left ear was dry, but there was still a severe discharge from the operative wound. Mercurochrome-220 in external wound and dropped in ears. (From this date on as long as packing was required in



the external wounds, all the dressings were made by filling the wounds with mercurochrome and packing gauze into the solution. The drops were also used in the external canals.)

May 4. Left ear dry; operative wound closed; some pus and considerable granulations in it when forced open. Less discharge from right ear; operative wound cleaner. Mentality and general health improving.

May 10. Still some pus in operative wound of left ear when forced open; open ulcer above operative wound of left ear has a good healthy scab. Purulent rhinitis is improving.

May 12. Left operative wound not disturbed. Cannot find bare bone at bottom of right wound, and canal. Nasal condition improved; patient breathes through nose part of time. Patient very lively, mentally and physically; is all over the house; helped arrange layout for dressing and insisted on bossing the work of dressing the wound.

The patient continued to improve steadily. On July 13 the packing was discontinued; there was a very slight discharge at this time in the middle ear. On August 5 a small fragment of bone was removed from the fundus of the right auditory canal, which had been acting as a foreign body and keeping up the discharge. From this time on the case was treated as one of chronic otitis media until it became dry and remained so early in October.

It is a well established fact that extreme fright, severe fatigue, and strong emotion have a profound effect on the thyroid and suprarenal glands and the central nervous system; and that this disorganizing effect if long continued will lead to functional exhaustion and the ill effects consequent upon the absence of the important secretions of these glands needs no argument. This being granted it only remains to point out why it seems evident that this patient was suffering from exhaustion of the thyro-adrenal apparatus and to demonstrate that the final cure was due to the thyro-adrenal preparation. It seems evident that some new factor entered the case on April 30 or May 2 that initiated the physical improvement. On April 30, the thyro-adrenal preparation was prescribed; on May 2 the use of mercurochrome-220 in dressing the wound was started. That the healing was due to the thyro-adrenal preparation rather than to the mercurochrome-220, with a slight absorption of mercury, seems to be proved by the following facts.

The mental deterioration and the muscular weakness, with the difficulty experienced by the patient in balancing himself and supporting his head on the shoulders is of the type to be expected in severe thyroid deficiency; this will practically always be accompanied by suprarenal involvement. The Sargent's white adrenal line exhibited by the patient, if not pathognomonic of a high grade of adrenal insufficiency, is strongly suggestive of it.

At least two different times was started toward improvement by measures directed to his internal secretions, once with a thyroid and the second time with a thyro-adrenal preparation, the latter showing the more phenomenal results.

The improvement in the mental and physical condition of the patient was more marked than the improvement of the wound, and even antedated it. This was too rapid to be due to the small amount of mercury that might have been absorbed.

Some profound systemic alterant must have been responsible for the rapid improvement and cure of a purulent rhinitis that existed from the 1st of January to the 1st of May, which resisted every form of treatment to which it was subjected, at times becoming membranous in spite of the treatment. This could hardly have been due to the absorption of mercury in the mercurochrome-220, but must be placed to the credit of the endocrines administered.

#### DISCUSSION.

DR. PHILLIPS said that every one should be encouraged to enter deeply and enthusiastically into all fields of research, and it might be that Dr.

Callison had hit upon a very clever solution of some difficulties that confront us, but one should not forget the old adage that one swallow does not make a summer; and it would have been better had Dr. Callison waited a few years and hunted through the literature and the clinics until he could have reported 100 cases instead of only one. But no claim for any new treatment should go out from the Academy based on a single case. Research should be encouraged, but no approval should be based on one case.

**Post Pharyngeal Abscess Following Chronic Purulent Otitis Media. Dr. P. P. Schoonmaker.**

J. C., colored, aged 57, a waiter, came into my service at the Post-Graduate Hospital on March 10, 1920, with the following history.

Had acute purulent otitis media in the right ear three months previously, following influenza. A myringotomy was done in New Haven, Conn., which gave relief for a time, but the discharge continued despite appropriate treatment. Some weeks later the pain returned in the ear, and the drum was again incised, this time by another physician. The pain continued over the right side of the head, and the discharge became very offensive, and the patient stated that he consulted one after another six different physicians, some of whom advised operation, others against it.

When he came under my observation on March 10, examination showed the drum membrane to be markedly congested, with a small opening in it closed by a large polyp which acted as a ball valve. When this was pressed away from the opening, a flow of very offensive pus issued. There was edema and pain on pressure over the mastoid, extending down the neck. The patient complained of deafness, vertigo, and pain over the side of the head and down the neck. Pulse, 112; temperature, 102; respiration, 24. The patient appeared very septic.

Blood examination: Leucocytes, 21,000; polys, 87; lymphocytes, 8. The bacterial examination showed pneumococcus infection. Urinalysis, negative.

Operation was performed the following day, March 12. The usual incision was made through the edematous tissues and periosteum, and the periosteum was elevated. The edema was evidently due to a periosteitis, as no pus was found beneath the periosteum. The mastoid antrum was opened with a great deal of difficulty, the bone being very sclerotic with a few diploic cells filled with granulations and pus. The mastoid antrum was filled with cholesteatoma under pressure, and the middle ear was filled with pus and granulations; the ossicles were almost entirely destroyed. The radical mastoid operation was completed.

On attempting to curette the Eustachian tube, a large quantity of pus welled out, filling the exenterated cavity; and investigation showed that the bony part of the tube was entirely destroyed. After carefully cleansing out the wound with hot saline solution and alcohol, it was tightly packed with iodoform gauze and a Pansa flap was made and stitched in place; and the ends of the posterior incision closed. The patient left the operating table in good condition.

The following morning he complained to the House surgeon of pain in the back of the throat, and examination revealed a fluctuating mass high up in the naso-pharynx. This was incised and one to two ounces of a creamy pus was evacuated. The cavity was carefully cleansed and wiped out, and a gauze drain inserted. Dobell's solution was frequently used as a gargle and mouth wash, and the abscess cavity was irrigated twice daily; and a gauze drain dipped in 25 per cent solution of argyrol inserted.

The patient did fairly well for some days, the temperature ranging from 99 to 101°, until March 18, the sixth day after operation, when the temperature dropped to 99°, and the pulse to 90.

On March 24, the patient had a chill, followed by a rise of temperature to 103°, pulse 120.

During all this time the patient had looked very septic and the abscess cavity in the throat was discharging considerable foul pus; the mastoid wound, however, seemed to be doing well and healing normally. It was therefore thought that the septic condition was due to the absorption of pus from the pharyngeal abscess. At this time also the patient complained of dyspnea, and examination showed a few rales and a hypostatic congestion over the posterior part of the chest; the heart sounds were normal, but feeble.

On March 25, the temperature dropped to 101°, pulse 96.

The following day, March 26, the patient had a second severe chill, the temperature rose to 104.4°, pulse 110, respiration 26, and a sinus thrombosis was suspected.

On March 27th, a third chill occurred and the temperature went to 106.2°; pulse, 138; respiration, 24, and the patient was taken to the operating room. The sinus was uncovered and opened, and a free flow of blood was obtained, but no clot was found. Notwithstanding the patient's condition, he seemed to be standing the operation fairly well, when suddenly he collapsed and died on the table.

No autopsy was obtained.

The conclusion reached was that a burrowing abscess destroyed the bony tube, going along the carotid artery and jugular vein in the neck and along the tube, causing the post pharyngeal abscess and death from septicemia.

The case was of unusual interest to the writer, as he had never seen or read of a similar one, and is now submitted for comment and to learn if other members have seen similar cases.

**Chronic Mastoiditis With Unusual Symptoms.** Dr. Perry Schoonmaker.

Dr. W. N. B., aged 46, Major A. E. F., contracted influenza in October, 1918, which was complicated by pneumonia and an acute purulent otitis media of the right ear. Having full charge of the troops on board a transport, and with inadequate help, he remained on duty the entire trip of nineteen days with a temperature ranging from 101 to 103°. The ear became very painful, with some mastoid tenderness. A myringotomy was done by one of the junior surgeons, no specialist being at hand. This gave some relief. On his arrival at Colon he was placed in the hospital and slowly recovered during a period of two weeks, the discharge from his ear growing less. His hearing was much impaired.

In the latter part of January, 1919, he was sent to the Walter Reed Hospital as a suspected T. B. His X-ray examination showed dark shadows of the right apex. During this time he had a recurrence of his otitis media. He complained of pain in the ear and over the mastoid, headache and vertigo and he had a dark grumous discharge of very foul smelling pus. He was discharged from the Hospital on March 25, 1919. His discharge papers read "General condition: Fair, with some impairment of the seventh nerve."

He returned home and after a short time resumed practice.

On August 28, 1920, I was called into see him at his home. The patient had been suffering from severe pain in his right ear and over the mastoid, with very severe hemicrania. He complained of vertigo at time of headache, also a small amount of foul-smelling discharge. Examination of his membrana tympani showed marked inflammation and bulging of the posterior super portion, with a small perforation in the anterior inferior quadrant. There was a small amount of foul-smelling discharge. A free myringotomy was done. Operation was advised.

On September 2, he was admitted to the Post-Graduate Hospital and a Schwartze-Stacke operation was performed. On opening the mastoid a very foul odor was noticeable at a distance of four or five feet from the table. The cells were of the large pneumatic type extending to the tip and well backward, and contained no pus, though they looked necrotic.

The sinus was exposed and the attic and antral tegmen found entirely destroyed, exposing the surface of the dura which looked necrotic. The mastoid antrum was filled with a thick cholesteatoma which was under pressure. The ossicles were easily removed and the radical operation completed. There was some roughness over the facial ridge, but the nerve was not observed. The ossicles showed no necrosis and the external maleolar ligament came away intact. The wound was packed with iodoform gauze and the operation completed in the usual manner.

The following day a slight facial paralysis was noticed, which was thought to be due to the tight packing pressing on the exposed nerve. The headache, vertigo and pain were immediately relieved. The patient sat up on the third day, and left the hospital on the tenth day. His convalescence was slow, the mastoid healing being sluggish over the exposed dura and facial ridge. The paralysis is improving slowly and he complains of no symptoms except when fatigued, when he has some headache.

The points of interest in this case are, the long continued subacute mastoiditis with marked destruction of the cells, sinus wall, antral and attic tegmen; the exposure of the dura; the normal condition of the ossicles; and the presence of long continued destructive inflammation, the vestibular irritation without involvement of the vestibular nerve and the late appearance of the facial palsy following the operation.

**Double Acute Purulent Otitis Media With Mastoiditis, Complicated by Diabetes and Tertiary Syphilis. Recovery Without Operation. Dr. Perry Schoonmaker.**

On May 15, 1920, the writer was called in consultation with Dr. J. W. McCready, to see Mr. G. S. W., aged 53, who was complaining of ear trouble.

Three days previous to the above date the patient had an acute cold, with obstruction of the nares, with free discharge. In trying to clear out the secretion, he blew his nose violently and instantly felt something snap in his ears. Following this, his hearing was markedly impaired and he felt pain in both ears. His family physician found both drum membranes congested, and bulging, and a slight discharge from the right ear.

On further examination I found both membranes red and bulging markedly in the superior posterior part (Schrapnell's membrane), tenderness over the right mastoid antrum, tip, and over the root of the zygoma. The patient's temperature was 102°, pulse 90, and he was unable to sleep on account of pains and headache. The nares were coated with a thick dry crust discharge of mucous of a very foul odor.

A free myringotomy was done in both ears, carrying the incision up to the attic and bringing it well outward on canal walls to cut open Schrapnell's membranes and give free drainage from the attic chamber. There was a free flow of seropurulent secretion from both ears. Hot saline irrigation was given every two hours and a wick drainage inserted down to the incision in the drums, and changed as often as they became moistened. An ice bag was ordered to be kept over the mastoid for twenty-four hours; a full dose of calomel was given, followed by a saline the following morning. Codene was given to relieve the pain and headache, and the patient had a more comfortable night.

The following day, May 16, the patient felt more comfortable, with a temperature of 99°. The pain over the mastoid was diminished, and a profuse discharge from both ears. The wick drainage required changing every fifteen or twenty minutes. The ice bag was omitted and the other treatment continued day and night. The nares were irrigated with a warm saline solution and the crusts cleared out with much difficulty. A 25 per cent solution of argyrol was applied to the nose and nasopharynx twice daily. This treatment was continued for three days with-

out any appreciable improvement, the mastoid became more tender on pressure, and the headaches returned.

A mastoid operation was strongly indicated. A urinalysis was made: Amount, twenty-four hours, ninety-three ounces, specific gravity 1.035, sugar 5 per cent, albumen, a trace, a few hyaline and granular casts. Secretions from ear showed staphylococcus aureus infection. The patient was very fond of sweets and starches and would eat a pound of candy during an evening. A strict diabetic diet was ordered; all sweets and starches prohibited and the amount of fluids restricted. The urine was examined daily. There was a gradual diminution of sugar to 3 per cent for a few days, then increased to 4 per cent. It was discovered that one of the nurses was giving the patient dry toast, which was causing the increase in sugar. Another nurse was employed and the Allen dietetic treatment followed which resulted in a gradual lowering of sugar.

The writer did not deem it wise to operate under these conditions, and Dr. Robert Lewis was called in consultation. It was decided that operation be postponed until a more favorable condition was attained, unless absolutely imperative. A myringotomy was again performed as the edges of the former incision were adhered and the opening nearly closed. The mastoid tenderness lessened but the discharge continued very profuse, and there was a constant pulsation seen through the perforation in the drum after cleansing the canal. Aspiration was now begun, using a piston syringe with an olive tip attached. From 5 to 20 drops of pus and blood could be drawn from the middle ear at each sitting. 5 or 6 drops of a 25 per cent solution of argyrol was used in the ear after clearing and pressure on the tragus forced it into middle ear. Later a Wassermann test was made, showing four-plus. Intravenous injections of salvarsan and intramuscular injections of mercury salicylate were given alternately every three days in increasing doses. As the doses of salvarsan and mercury were increased the symptoms improved and within one week the urine was sugar-free and amount nearly normal: The temperature for the first week ranged from 100 to 103°, pulse 80 to 96, and for the next two weeks from 99 to 101°, pulse 75 to 85. The patient, a strong, robust man, lost flesh and was greatly weakened for the first three weeks.

The patient made an uneventful recovery, with the hearing somewhat impaired. The hearing was tested on June 9, a moderate whisper heard twenty feet in right ear and low whisper twenty feet in the left, with watch 1/36 in right and 2/36 in left.

This case very strongly brings out some underlying conditions which may be present and greatly influence the course and treatment of the mastoiditis. In this case the presence of both diabetes and lues made the treatment of his condition one in which conservation was necessarily employed in the matter of operation, and with very favorable results.

**Acute Meningitis Following Extra-dural Abscess; Seeming Recovery; Recurrence After Six Months. Dr. Robert L. Loughran.**

This report describes the case of a male, 37 years old, whom I saw first on March 1, 1920, immediately upon his arrival from the West, where three weeks previously he had an attack of purulent otitis media associated with an acute tonsillitis, the membrana tympani having ruptured spontaneously. The discharge had continued, although all other symptoms had been relieved, except for an occasional dull pain in the ear.

When I examined him, there was a small amount of thick purulent discharge with some boggy of the drum. I incised the drum and he continued to improve under local treatment, so that within three weeks, it looked as though resolution would be complete.

On April 3, following his becoming drenched in a rain storm, the otitis lightened up again and within three days he began to have evidence of mastoid involvement. Microscopical examination of the purulent exudate showed many degenerated pus cells, and a culture showed a growth of



staphylococcus aureus and a micrococcus catarrhalis. Leucocytosis was 14,000 and a poly-nuclear percentage was 85.5. Operation was advised and refused for five days, when evidence of extensive involvement of the mastoid having appeared, it was consented to.

A simple mastoid operation revealed the mastoid bone thoroughly broken down, with an extension of the necrosis upward and forward for at least one inch and one-half from the antrum, giving an exposure of the dura of the middle fossa at least one inch in diameter, this being the site of an epidural abscess. The dura did not show any involvement further than considerable congestion.

broken down, with an extension of the necrosis upward and forward for marked physical depression. The temperature during this time had not been higher than 99° Fahrenheit and the pulse between sixty and eighty.

On the fifteenth day after operation, his temperature rose to 104.4° Fahrenheit and on the following day he began to show evidence of spinal irritation, with a moderate general headache and some rigidity of the neck. A blood count showed a leucocytosis of 12,600 and a poly-nuclear percentage of 78. A blood count showed no growth at the end of forty-eight hours. Fluid from a spinal puncture was turbid and under slight pressure with a cell count of 3,500 per c.mm.; globulin-albumin in marked excess.

Differential count showed: Lymphocytes 90.0 per cent, endothelial cells 1.0 per cent, polymorphonuclear neutrophils 90.0 per cent. Culture showed a growth of staphylococcus aureus.

Physical examination demonstrated stiffness and retraction of the neck. Pupils equal and respond to light; scaphoid belly not marked; tache cerebrale present but not marked; Babinski positive on right, negative on left; Kernig positive on right, doubtful on left; leg reflexes, negative; neck and knee negative. Pulse 70; sweating, no chill.

Dr. John B. Rae saw the case in consultation and a diagnosis of purulent meningitis was made.

For four days following, the temperature remained around 102.4° Fahrenheit when it began to decline gradually, until it became normal four days later, where it remained. During these eight days the symptoms of spinal irritation decreased, day by day, and had disappeared by the eighth day; from then on the patient continued to convalesce; the mastoid wound continued to fill up and have a healthy appearance, and at the end of seven weeks his condition was such to warrant his return to the West (a matter of necessity), although he did not pick up physically and he seemed mentally depressed, a condition which had persisted during his illness. The wound had practically healed when he left.

I have no history of his progress during the summer, except that the physical and mental depression continued and that he had an "occasional headache," this gained from a letter written by himself.

On September 14 I received a telegram from his physician, stating that "while on a railroad journey the patient had had a severe headache and became ill." He was transferred to Chicago and placed under the care of Dr. Shambaugh. The report received a few days ago states that he saw the patient on September 17, with symptoms of severe headache, which had lasted for some weeks, during which time he had been running a temperature. The clinical symptoms indicated a diffuse meningitis; rigidity of the neck; positive Kernig and a high cellular count of the spinal fluid. The culture was negative.

An exploratory operation was performed but this did not demonstrate any distinct evidence of a dangerous focus in the region of the mastoid. The process of meningitis was not influenced in any way by the operation. The patient died in less than a week after the operation.

The case is, therefore, one of acute purulent meningitis, of staphylococcus aureus infection, which apparently cleared up, as far as symp-



toms, were concerned, but one in which the acute stage subsided into a latent one, bound sooner or later to lighten up again.

Had it been possible for the first operation to be performed at the time it should have been performed, there is every reason to believe that a very distressing result would have been avoided.

**Demonstration of General Surgical Cases at Base Hospital 61, Beaune, France; Lantern Slides.** Major Robert H. Fowler.

It is a pleasure to have the opportunity of showing you this evening, in lantern slides, photographs made at Base Hospital 61, Beaune Cote-D'or, France, at the time of the Argonne Drive. The men were being evacuated from that part of the line through Dijon to our group of hospitals. Some of them were men from the "Lost Battalion."

You will remember that at one of the recent sessions of the Section Dr. Stuart Craig spoke of the results that had been obtained by using Dakin's solution, in the wards of the base hospitals in the A. E. F. My intention is to co-operate with Dr. Craig and, by showing the slides this evening, to demonstrate in the most graphic way the results which convinced many of the surgeons in the A. E. F. that the Carrel-Dakin's solution, as used in the army, served to prevent wounds becoming infected and to clear up infected wounds more quickly.

The first slides in the series show various types of wounds in general surgery, including bayonet wound of abdomen, gas gangrene of knee, and superficial wounds of several types. One patient, a sergeant, is shown, who came to the ward with sixteen separate wounds.

The slides show these wounds healing, and should convey to your mind the idea that this treatment prevented many of the dangers and practically all the discomforts which are seen with wounds containing pus.

One series of slides shows the progress in healing of a large superficial wound. When first seen this wound actually measured  $5\frac{1}{2}$  by  $8\frac{1}{2}$  inches. The superficial gluteal muscles had been carried away. Under Dakin's solution a clean, granulating surface formed. The lower end of the wound was conserved and raised from day to day so as to close this large area and lessen the space involved in the scar. The adhesive strap used for this was passed through a flame before being applied and the wound contained loose gauze with Dakin's tubes used for irrigation at regular intervals. In this case the wound was finally excised and a linear scar resulted.

In relation to the use of this method in mastoid wounds, let me show photographs of Private J. C., Company E, 110 Infantry. Diagnosis: Acute mastoiditis, left with thrombosis of lateral sinus. On his field card was a record that he had suffered from gun-shot wound, left mastoid, and that foreign body had been removed, found embedded in the mastoid process, at the field hospital. The patient made an apparently complete recovery from his first operation, but later developed the signs of an acute mastoid infection. After a simple mastoid, done in the usual manner, the lateral sinus was examined, and it was found that this bony sinus wall had been fractured and two large pieces were embedded in the vessel itself, obliterating its lumen (breaking the shell without spilling the egg). The thrombus was exposed on opening the thickened sinus wall, and it was decided to tie off the internal jugular because of the probability of infection to this thrombus. Dakin's solution was used in both wounds, and the patient made a complete recovery.

In conclusion, the results of the Dakin's solution treatment in Ward 6, B. H. 61, show:

First. That superficial wounds of various character were less apt to become infected and were more quickly cleared of infection by this method.

Second. That deep wounds, involving bone destruction, gave less encouraging results with Dakin's treatment than the wounds of the soft parts.

Third. That where Dakin's treatment is easily available, it may be used in mastoid wounds with success.

These slides show in the most graphic way the results of the treatment as we saw them. You may yourselves draw conclusions as to its value. Any credit that is due, in the opinion of the surgeons of the A. E. F., if I may be allowed to speak for them, should be given to those who had the foresight and vision to work this thing out and have it ready, at the time it was so much needed by our boys "over there."

There is too strong a tendency nowadays to criticize. Two seldom do we hear praise. But the credit due should be given to Rockefeller, to Dakin, and to Dr. Carrel. New York should be proud of these men.

If every doughboy could voice his gratitude for having been spared pain, and, perhaps, saved the use of his limbs, it would indeed form a fitting tribute.

**Diagnosis of Oto-Sclerosis.** Dr. Perry Goldsmith.

#### DISCUSSION.

DR. PHILLIPS said that he really did not see how Dr. Goldsmith had found the time to get together such a fine presentation of the subject. Little remained to be said in discussing it, for he agreed thoroughly with all that had been said. One of the comments which Dr. Goldsmith had made had interested him very deeply, i. e., that the literature of the subject abounds in the statement that the diagnosis of the condition can be made by the ocular demonstration of the thin membrane through which you can see a red promontory. Dr. Phillips said that in his experience the showing of these symptoms were few and far between.

So far as his experience went, a large proportion of all cases of otosclerosis had also more or less retracted

The point that really impressed him, however, was the early age at which this disease comes on and the fact that in the majority of cases it is bilateral from the beginning. That was very important.

In regard to the treatment, Dr. Goldsmith had in the last part of the paper struck the key note that was important not only in regard to otosclerosis but to all deaf persons, and that was that when we honestly tell these patients that there is no use in continuing the treatment of the condition we are recreant to our highest ideals if we do not at the same time tell them that they have a right to live as well as any one and have a place in the world, and do whatever is possible to help find the best place for them to occupy.

Dr. Phillips said he did not know how many of those present were familiar with what some had been doing in this respect, but that he almost never had such patients without bringing them into contact with the New York League for the Hard of Hearing where the women there who are similarly afflicted, and letting them see how a deaf person can live and be useful and happy. That is the treatment that ought to be given to all deaf persons, and he had seen it work well in a great many cases.

He expressed regret that he could not discuss the pathology of the condition, as he made no claim to being a pathologist.

He then related a recent experience distinctly in line with one of Dr. Goldsmith's suggestions. A patient recently came to him from a distant city, who was totally deaf in one ear. Her father and one brother had otosclerosis. She had a family of three children, none of whom

were deaf as yet. She stated that one of her daughters had fallen in love with a young man whose family history was similar to hers—one of his parents and two of his sisters being deaf—and she herself feared the outcome of such a marriage. He had given their mother Grey's statistical reports which she had had her daughters and the prospective groom read. This mother wished to know his opinion on the subject, and he had told her that he did not see how under such conditions they could hope to have children with any guarantee of there not being a considerable proportion of deafness among them. As a consequence, the engagement was broken off and the couple decided not to marry.

Dr. LEDERMAN said that so far as the pathology of these cases was concerned, he was in the same class as Dr. Phillips and would not attempt to discuss the pathological nature of the affection. He wished to add his views to those of Dr. Goldsmith in reference to the appreciation of any patient suffering with otosclerosis or any other form of progressive deafness when they get some tone they had not appreciated before. Dr. Lederman cited two instances coming under his own observation; one of them having an oto-sclerotic condition and the other suffering with nerve deafness. On testing them with an instrument which he uses for that purpose, they found that they were able to appreciate various tones, although they could not distinguish the voice. While they recognized the fact that they would no longer be able to distinguish voices, the fact that they could still distinguish and appreciate sounds, made them feel that there was a chance for them to be useful members of society. The psychological element is very important in these cases.

He also corroborated what had been said about hydrobromic acid dil in somewhat larger doses than mentioned by Dr. Goldsmith. In some cases he had found it to have a good effect upon the tinnitus. He desired to emphasize the importance of lip reading in these unfortunate individuals and to suggest any form of mechanical aid to hearing, that might improve their condition.

Dr. VOISLAWSKY said that one of the points that had impressed him most was telling these patients (as soon as you get them) to practice the study of lip reading both for their own good and because it taught them to be attentive: for, as they become deafer it will enable them to read lips and thus enjoy conversation with others. Also that it helps to save the hearing they have by paying attention. This point had never been brought home to him so strongly as by Dr. Goldsmith this evening.

Dr. HAYS said that after hearing this excellent and scientific paper he still had to ask the question: What is oto-sclerosis? although Dr. Goldsmith had given the various points of view of men who seem to know something about the subject.

The point of main interest is the number of patients who consult otologists and are told that they have oto-sclerosis without the otologist making a thorough examination and finding out whether or not the condition can be improved. Probably all present knew of cases where the otologist has made the prognosis on the family history, etc. He had gone into some of these cases quite thoroughly, and had improved some in which the condition was not oto-sclerosis—so it would seem that the term may be used by many men who are not willing to take the time to find out whether or not the condition is really oto-sclerosis.

Another question was that of the auditory re-education. Both Dr. Phillips and himself had seen much evidence of that in the New York League for the Hard of Hearing; but he had never been so much impressed in that respect as on a recent visit to Dr. Goldstein in St. Louis and saw the work he is doing there. Young men who could hear nothing two years ago can now carry on a conversation.

In order to bear out what Dr. Goldsmith had said about children who have not been educated to certain sounds or have been auditorily stupid,

actually being classified as deaf mutes, Dr. Hays stated that he saw in that same school a boy who for fifteen years had been classed as a deaf mute, whose hearing is now as good as that of most persons.

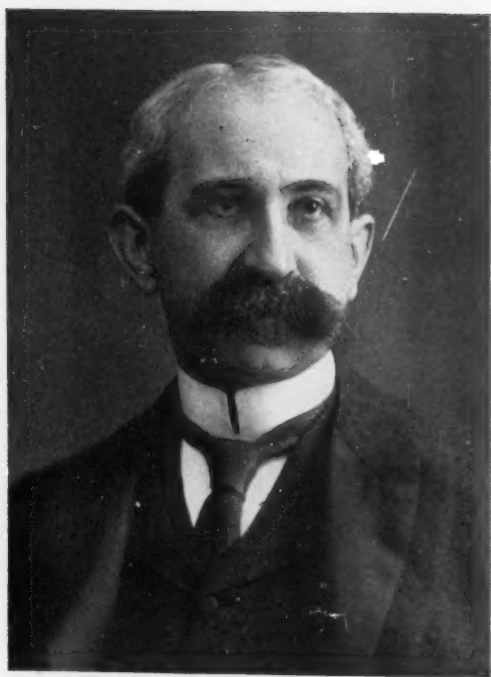
As time goes on otologists generally will come to feel that their duty is not confined to the strictly medical standpoint, but that the sociological and educational features are also of great importance.

DR. GOLDSMITH expressed his gratification at the opportunity of appearing before his friends and of their appreciation of his efforts. He was glad to hear what Dr. Phillips had said about not seeing the flamingo-red sign. It is a habit which is repeated in all the text-books, but very few see it. He had been hunting for this sign for years and had seldom seen it. It is very important to recognize that you have a pathological lesion that you cannot cure; you can offer very little, but there may be on top of that a functional condition the relief of which may be just enough to encourage the patient. He then cited the case of a nurse who had a typical oto-sclerosis and had aural nasal operations and ..... of inflation with no improvement. She had never been told anything about lip reading and knew nothing about it. After a course of lip reading she is now back at her work, and moreover claims that she hears better. A large functional element was relieved by psycho-therapy.

In New York there are a lot of teachers, and embryo specialists are being sent out all over the country. There is a big responsibility upon the teaching profession if they fail to impress on the new specialists that operation on such patients is not only apt to make them worse but that it degrades the profession.

With regard to artificial aids to hearing, Dr. Goldsmith said that he tells his patients to go to the place where these are sold and try them, and if they find something to help, well and good; but not to pay for it until they have had it home some time.

It is a dangerous thing to make a diagnosis of oto-sclerosis and let a patient go away disheartened. One should not tell patients who have oto-sclerosis that nothing can be done for them. In one instance a patient had consulted a man in London, who had an international reputation, and he told her that nothing could be done for her. She went away very much discouraged, and some one sent her to see another man, not nearly so able as the first. He was very good and gentle and encouraged her, and told her that she could be made better if she had her nose operated upon. She did not have her nose operated upon then, however, but later consulted Dr. Goldsmith. He agreed with the first man but took a lesson from the second; and told her that if she wished to have her nose operated upon for the sake of that condition, all right, and if she thought it would help her hearing, well and good. He resected the septum, and kept a careful record of her hearing, etc. When seen a couple of months later, she was seemingly much better, though the record of her hearing showed no improvement, but she had a sense of well being and felt herself better. In her opinion, the first man was all wrong; the second man was a good one, and his advice was carried out. It is wrong to make a diagnosis of oto-sclerosis on the first visit. Never do it until you can make sure it is not a case of middle ear obstruction, etc. Also, never take the word of the patient in regard to the result.



*Felix Simon.*





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### IN MEMORIAM.

Sir Felix Semon, veteran laryngologist, dean of the British laryngological world, internationally recognized master in medicine, special surgeon, editor and critic, has joined the ranks of the immortals.

Since the time of Sir Morell Mackenzie, no individual influence has been more potent in the development of British laryngology and its maintenance on highest standards than that wielded by Felix Semon.

His exhaustive and classic contributions to the question of the innervation of the larynx alone have immortalized him in medicine. Semon's law that: "In all progressive lesions of the centers and trunks of the motor laryngeal nerves, the abductors of the vocal cords succumb much earlier than the adductors" has received general acceptance. His contribution to the central motor innervation of the larynx and his conclusions that "it is practically impossible for a one-sided cortical lesion to produce laryngeal paralysis" is an important axiom. British laryngology has been supreme in its research in malignant disease of the larynx, and it was the privilege of the writer to see some of the splendid co-operative work of Sir Felix Semon and Sir John Butlin on frequent occasions. Semon pointed out that carcinoma of the larynx had its site in the vocal cords more frequently than any other as the locus minus resistencie. Prompt diagnosis, laryngo-fissure and early operation was urged by this master as the best procedure in this class of cases.

In 1912 he published a splendid classic in two volumes entitled, "Forschungen und Erfahrungen," a collection of selected monographs gathered from a rich, practical experience of thirty years. The first group of monographs include his contributions to the physiology, pathology and history in the study of the nerves of the larynx. His profound knowledge of the intimate physiological and neurological larynx qualified him most eminently to discuss these important questions authoritatively and to co-relate his clinical findings in certain and definite form. Among the delightful essays which lend an intimate personal touch to his laryngological associations are: "Personal Reminiscence of Rudolph Virchow," "The Unveiling of the Wilhelm Meyer Monument in Copenhagen," "The Centennial of Manuel Garcia," and "An Appreciation of Sir Morell Mackenzie." In the preface to these monographs Semon quoted characteristically, "Leben heisst: Ein Kämpfer sein" (To live is to

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struggle), and what a valiant contender for rights and principles he was! Frank, fair, fearless! His was an assertive, energetic personality. He always had the strength of his convictions and the forcefulness and brilliancy of mind to maintain them.

It was the gentler side of his nature that those who knew him best appreciated most. During the Louisiana Purchase Exposition in St. Louis in 1904 Sir Felix and Lady Semon were our personal guests for a period of a week and it was then that we had so kindly an insight into his deeper nature. His address at the International Congress of Sciences and Art in St. Louis on this occasion on "The Relations of Laryngology, Rhinology and Otology With Other Arts and Sciences\*" is a splendid tribute to modern oto-laryngology and an unusual evidence of his mental versatility. At the time of its presentation it was regarded as one of the masterpieces of the many addresses delivered at this International Congress.

A keen lover of music and the arts, it was a rare treat to wander with him through an art gallery, to feel his inspiration and enthusiasm at a concert, to visit in his home when he was surrounded by leading representatives of the arts or to listen to his recounting of an interesting episode in his life or personal reminiscences of association with many of the distinguished and cultured men and women of Europe.

As Editor of the *Internationales Centralblatt für Laryngologie* there was another bond of sympathy and camaraderie between us and we cannot fail, even on this occasion, to refer to the heartless and relentless act by which his name was struck off as part of the original title of "Semon's *Internationales Centralblatt für Laryngologie*." To those who appreciated his splendid contribution to medical journal literature and the high standard to which he raised this invaluable periodical, it will always be remembered as Semon's *Centralblatt*.

He was an occasional contributor to *THE LARYNGOSCOPE* during the past two decades and it is only a just observation to add that every contribution that he made to medical literature helped to maintain and to raise its dignity and standard.

Our last personal letter from him was an acceptance of our earnest invitation to him to contribute an article to the Twenty-fifth Anniversary Number of *THE LARYNGOSCOPE*, to be published next July. Even in the face of much physical suffering there was a cheerful

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\**The Laryngoscope*, October, 1904.

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strain to his letter and the same evidence of his camaraderie and good will.

To Lady Semon and the family we offer our heartfelt sympathy. We knew of that splendid and close companionship and we feel that its memory will be a constant solace. Laryngology and the medical profession have been enriched by his labors and his many talents. His personal friends have lost a dear and respected comrade.

M. A. G.

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#### OBITUARY.

Sir Felix Semon, K.C.V.O., M.D., F.R.C.P., died at 10 o'clock on Tuesday night, March 1, at Rignalls, Great Missenden, at the age of 72 years. In accordance with his expressed wish, his funeral was private.

He was born at Danzig on December 8, 1849. He began his medical studies at Heidelberg in 1868, and during the Franco-Prussian War served as a volunteer with the 2nd Uhlans of the Prussian Guard, being present at the battles of Amiens, Bapaume, and St. Quentin, and the sieges of Metz and Paris. The war being ended he resumed his medical studies and took the M.D. degree at Berlin in 1873, and the German Staats Examen in the following year. He then studied in Vienna and Paris, devoting his attention more particularly to diseases of the throat and nose, and becoming expert in the use of the laryngoscope, then recently introduced into medicine.

Semon decided to settle in England, and acted as clinical assistant at the Throat Hospital in Golden Square in 1875, was admitted a member of the Royal College of Physicians in 1876, and was elected F.R.C.P. in 1885. He became physician to the Throat Hospital in 1877, and was appointed assistant physician in charge of the Throat Department at St. Thomas' Hospital in 1882. In 1888 he was elected laryngologist to the National Hospital for Epilepsy and Paralysis in Queen Square, Bloomsbury. In 1894 the German Emperor conferred on him the title of Royal Prussian Professor, the Order of the Red Eagle having been given him in 1888. In 1893 he was one of the founders of the London Laryngological Society—now merged in the Royal Society of Medicine—and was elected President for the years 1894-6. At the Diamond Jubilee in 1897 he received the honor of knighthood, and in 1902 he was decorated C.V.O., being advanced to K.C.V.O. in 1905. In 1897 he resigned

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his appointment at St. Thomas' Hospital owing to the increase in his private practice, and in 1901 he was appointed Physician Extraordinary to King Edward VII.

Semon continued to enjoy a large laryngological practice until 1911, when he retired. British laryngologists and many of his foreign confreres then collected a sum of \$5,000 as a testimonial to the esteem in which he was held. This sum he presented to the University of London to establish "The Semon Lecture Fund" for the purpose of awarding a commemorative bronze medal for the best work in the treatment of diseases of the throat and nose, and to found a lectureship to be called the "Semon Lectureship in Laryngology." In 1884 he founded the *International Centralblatt fuer Laryngologie und Rhinologie*, and for twenty-five years he acted as its editor. He married in 1879 Louise Doretta Augusta, daughter of H. Redeker, of Cloppenburg, Oldenburg, and had issue three sons.

Thus briefly is given a sketch of the active life of one who was a master, and an earnest worker in the field of laryngology in general and of British laryngology in particular.

After his retirement he collected most of his scientific papers which had been published at various times and in diverse languages, in two handsome volumes called "Experiments and Experiences" (*Forschungen und Erfahrungen*).

Among his greatest achievements were the study of the nerves of the larynx and their function, and his splendid work in cancer of the larynx. In the former work he had the co-operation of his warm friend, Sir Victor Horsley (to whom the volumes of his collected works are dedicated) and the results of this combined work are so permanent that a law has been established known as Semon's Law. These refer to the innervation of the larynx.

Long before the honor of knighthood was conferred upon him by the gracious act of her Majesty, Queen Victoria, Semon became the champion and true knight of the infant specialty, laryngology. He was splendidly armed for such a fray by early education, with an indomitable will, a mind that was quick to grasp any problem and act wisely thereon, a loyal and enthusiastic love of his subject and a firm believer in the present and future value of his chosen life work. There were many battles, hard fought, and the high standing of laryngology today is the answer as to who won the fight. With Semon it was "Thrice is he armed who knows his

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quarrel just," and he always had the courage of his convictions. Quick as he was to attack, he as readily forgave and he never carried enmity. It is doubtful if those whom he worsted ever forgot or forgave.

Semon was the first to publish a *Centralblatt*, and the idea was later copied in every branch. His aim was to collect the world's literature of laryngology and make it an international repository of the writings of all his colleagues in every land. It was in connection with this editorship that I first became intimately associated with him, and a close friendship formed, which lasted, without a single discordant note, for over twenty years. As an editor, he was ideal. The broadest scope was given to his collaborators, he never failed to acknowledge promptly the receipt of their letters or abstracts, and he often found occasion to comment on the latter. He would criticize or find fault if he thought it was required, but he was lavish in his praise. He took pride in his *Journal*, and on the occasion of its twenty-fifth anniversary and his retirement, no gift or attention of the many he received pleased him more than the loving gift of his past and present collaborators. This consisted of a silver box made by Tiffany in the shape of a bound volume of his *Centralblatt*, having on its face an exact copy of the printed cover of a monthly number, with the names of the donors, and "in loving recollection of his many kindnesses to each of them, and in recognition of his valuable services to humanity."

Americans will remember his visit here with his charming wife, when he came as the guest of the government to deliver an address at the World's Fair in St. Louis.

He was received everywhere with honor, and the dinner given him in the City of New York under the auspices of the Section on Laryngology of the New York Academy of Medicine was largely attended and most successful.

He had occasion to learn from that visit to our country of the high esteem in which he was held and he highly appreciated the attentions shown him.

After his retirement he kept in touch with his friends; he was an ideal correspondent, his letters were vividly interesting and brimful of loyal affection and regard.

Semon was a man of many sterling traits. He had command of at least four languages, which he mastered with such ability that no native could excel, a deep student with a most scientific mind, skillful as a surgeon, a fascinating lecturer, unusually clever in debate

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with a rare fund of humor, a delightful raconteur, and exceedingly ready in repartee. At the time when Mr. Gladstone was busy electioneering, and his voice refused to function, Semon advised rest of that organ. An enthusiast seizing the opportunity, spoke of Semon as "the only man that silenced Gladstone," to which Semon promptly replied, "Sir, my laryngoscope knows no politics." He was an enthusiastic sportsman, fond of hunting and fishing; an accomplished musician, and a composer of note.

Sir Felix was generous, large-hearted and full of kindly tact.

We recall his forceful and touching appeal for help for the widow and children of our late colleague, Jules Broeckaert, who died of exposure as a refugee in England.

Semon became at once protector and guardian to the family. His special care was one of her sons who was sickly; he gave her a weekly allowance, and on her return to Belgium gave her the tidy sum still remaining.

He would permit no public announcement of these funds received, fearing possible offense to the feelings of the lady.

The grateful letter sent me by the widow before her return home voiced her undying thanks to Sir Felix, who was to her a guardian angel.

In the death of Semon, our loss is great; we shall miss him for his faithful correspondence, his cheerful approval of the work of younger men, his loyalty to his specialty and the country that gave him its highest honors, his faithfulness to his friends and for the kindly whole-souled gentleman and honest brother that he was.

His home life was ideal; he was most happily mated, and the welcome extended by both Lady Semon and himself to those whom he loved to have about him there, was generous and bountiful.

With profound and sincere regret and deepest sympathy with his family this last tribute of love and respect is paid to his memory.

While life lasts we shall bear him in fondest remembrance, for we had for him that

"True friendship that hath in short a grace  
More than terrestrial in its face,  
That proves it heaven descended.  
Man's love of woman not so pure,  
Nor, when sincerest so secure  
To last, till life is ended."

—EMIL MAYER.

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